DOST-FNRI SHINES

Shifting and Harnessing Innovations towards NEw Solutions to end Malnutrition

2023
ANNUAL REPORT
DEPARTMENT OF SCIENCE AND TECHNOLOGY
FOOD AND NUTRITION RESEARCH INSTITUTE
DOST-FNRI

About the Cover

The Institute aims to shine brighter in the next ten years, 2024-2033, as it shifts and harness innovations towards finding new solutions to end malnutrition.

The cover features awards, activities and events that made DOST-FNRI even brighter in 2023. The cover has bright and vibrant yellow waves to convey energy, optimism, and vitality as the Institute continues to show growth and transformation brought about by innovation in nutrition.

2023 is another challenging year that DOST-FNRI faced. Equipped with a strong-willed Management and competent staff, new and improved facilities and support from stakeholders who believe in the vision and mission of the Institute, DOST-FNRI is poised to play a significant role to win the war against malnutrition.

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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 risks and opportunities, and to continually improve the effectiveness of our QMS at all times.

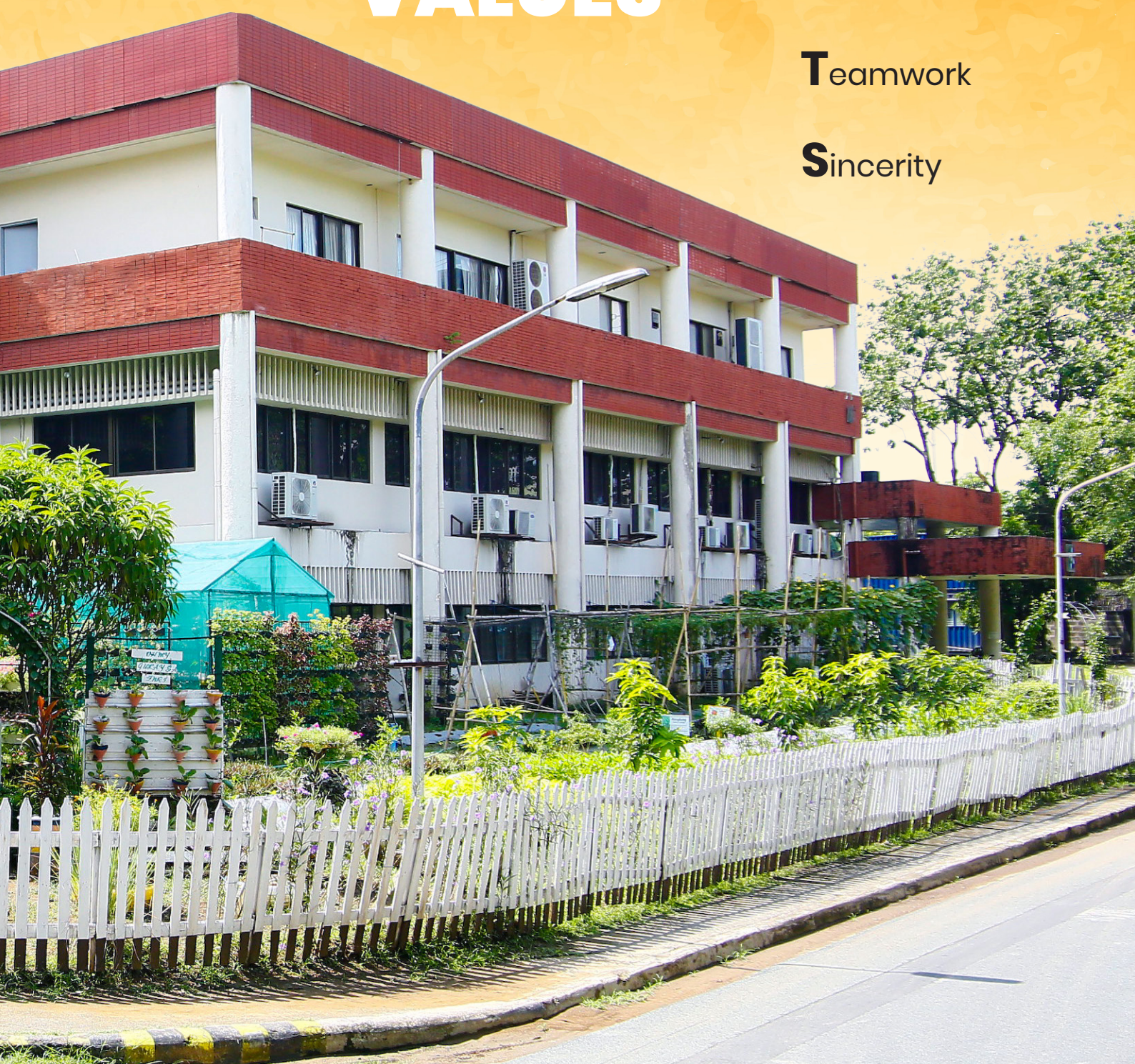
FNRI CORE VALUES

Excellence

Action-oriented

Teamwork

Sincerity



Message from the Secretary

The Department of Science and Technology (DOST) warmly congratulates the DOST-Food and Nutrition Research Institute (FNRI) for its remarkable contributions to the attainment of the Department's goals in 2023.

The National Nutrition Survey and the Expanded National Nutrition Survey played critical roles in the determination of the nutritional state of the country and the appropriate nutrition interventions to address food security, diet diversity, assessment of risk factors of certain population groups, among others.

I commend the Institute for its continuous efforts in developing exceptional and high-impact projects. These initiatives effectively helped bridge the gap between malnutrition and food security in the country.

The Institute launched its newly-developed nutritious food products, namely: (a) Nutricocokies; (b) CocoDairy Milk Blends; (c) Nutribunnets, (d) New Enhanced Nutribun Variants; and (e) Nutri-Calaman-C Juice. The DOST-FNRI Stabilized Brown Rice, also known as Kayumanggi, received a Bronze Prize Award from the Korean Invention Promotion Association during the Seoul International Invention Fair in South Korea. Additionally, it was honored with a Special Award from the Indonesian Invention and Innovation Promotion Association (INNOPA) during the same event.

This year has indeed been highly rewarding for DOST-FNRI, marked by numerous local and international accolades. These recognitions are a testament to the Institute's unwavering commitment to uphold its core value of excellence in conducting research and development, and in providing technology transfer and commercialization in food and nutrition.

Furthermore, the Institute was recognized as the DOST Agency with the Highest Number of Utility Model Registrations by the DOST-National Academy of Science and Technology (NAST) during the 2023 DOST Intellectual Property Awards. In addition, 18 scientific papers were published, and one (1) international award was given for Best Poster from the Asia Pacific Food Analysis Network (APFAN).

The achievements were made possible because of the endless opportunities DOST provides to its valued human resources through formal and non-formal trainings. I hope these ignited the interest and inspired other personnel to continue honing their skills and expanding their knowledge on food and nutrition research.

Rest assured that all these endeavors will be supported by DOST to attain DOST-FNRI's vision of providing optimum nutrition for all Filipinos.

I would like to extend my utmost gratitude and congratulations to DOST-FNRI, through the dedicated leadership of Dr. Imelda Angeles-Agdeppa, for the limitless innovations in providing new solutions and opening opportunities to alleviate malnutrition in the country.

I am confident that the Institute will continue to shine in the coming years. Mabuhay ang DOST-FNRI!

RENATO U. SOLIDUM, JR.
DOST Secretary

Message from the Director

Science made us aware that the stars which shine the brightest are those closest to the Earth. The luminosity comes from an immense amount of energy within their core. Just like the stars, the Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI) has been a beacon of light through responsive science, technology and innovation in addressing malnutrition and other nutrition-related concerns.

Over the past decades, we have scaled-up efforts in diffusing the science behind nutrition and developing food technologies to help improve the nutritional and socio-economic state of the population. Through continuous dedication, we successfully carried out 32 research and development projects addressing a wide range of concerns including macronutrient and micronutrient deficiencies, nutrition-related diseases, food quality and safety, and delved into other factors affecting nutrition.

Among our remarkable accomplishments is the internationally-recognized technology, Kayumanggi or Stabilized Brown Rice, which bagged the Bronze Award at the Seoul International Invention Fair (SIIF) 2023. Through the *TAGPUAN*: "*TAGpuan ng* Partners *na UmAdopt ng* Nutritious Food Products", we introduced eight innovative technologies, namely: Nutricocokies, Nutri-Calamansi Juice Drink, Nutribunnets, three variants of New Enhanced Nutribun, and three variants of Coco Dairy Milk Blend, and highlighted the experiences of successful DOST-FNRI technology licensees.

The collaborative efforts of our different divisions have been the core of the Institute's shining power, as they effectively spearheaded programs through innovative projects that benefit Filipino households. Innovations in food products and other nutrition-related technologies have consistently adapted to meet the nutritional needs of Filipinos, as highlighted by the results of the Expanded National Nutrition Surveys (ENNS).

This year, we were able to develop and pilot-scale the Nutribunnets and Nutricocokies and reformulated the Enhanced Nutribun for the School-Based Feeding Program. This commendable dedication of the Institute to technology formulation and innovation towards addressing malnutrition has been evident throughout 2023.

Studies defining the Filipino's nutritional status, particularly on nutritional adequacy, dietary intake, food security, snacking patterns, and evaluation of the meal balance index, were executed and paved the way towards the formulation of science-based strategies and programs that answer the discovered nutritional gaps. Some of these are Supporting Adolescents Growth in the Philippines (SAGIP) Project for teenagers and the Healthy Aging Program for Pinoy or Project HAPPY that aim to contribute in ensuring full functional capacity and quality of life of the older population.

Our research and development outputs and science and technology services have reached the public through numerous food and nutrition trainings, IEC materials, nutrition tools and references, and technology transfer activities. These projects gained unprecedented visibility, reaching Php1 billion in media mileage through television, radio, print, and social media.

As we navigate through the evolving society which is now driven by never-ending challenges requiring high-impact innovations, the Institute will continue to work tirelessly and rigorously. We are committed to honing individual skills to build a strong and effective team.

Let us be like stars to our fellow Filipinos, shining day and night, radiating the power of science, technology, and innovation. May our knowledge and passion for research continue to fuel the energy within our core.

While stars may appear small to the naked eye, they are a testament to the power of unity. As the battle cry of the Institute goes: "Oneness is Success", DOST-FNRI is poised to be the country's guiding light in food and nutrition.

Thank you for the continued support and in fueling our core to shine brighter!

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

PURSUED R&D NUTRITIONAL 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
- Nutrition Survey and Related Studies
- R&D Program on Intervention and Policy Studies
- In-depth and Correlation Studies
- Technology and Knowledge Diffusion Program

STRENGTHENED STI COLLABORATIONS

29	government funded R&D and S&T projects
13	funded project from international organization
4	funded projects from private industry
1	funded projects from foundations/ professional organizations/individuals

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SHINES

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146 AWARDS

ENHANCED EFFECTIVENESS OF STI GOVERNANCE

25
Scientific papers published

60
Scientific papers presented

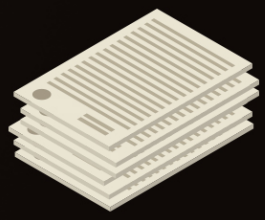
MAXIMIZED UTILIZATION OF R&D RESULTS THROUGH TECHNOLOGY TRANSFER AND COMMERCIALIZATION

78
site visits conducted

59
trademarks, patents/utility models, and copyrights filed

177
TLAs signed

47
trademarks, patents/utility models, and copyrights approved



DEVELOPED STI HUMAN RESOURCE

DOST-FNRI Library

57 Walk in library users

523 Online clients

101 FIRSt collection including publications, theses and dissertations

Trainings

59 In-house Trainings

18 On-the-job trainings

Social Media Insights

375,965 Total engagment in Facebook

71,560 Tweet impressions

38
IEC MATERIALS
developed and disseminated

TOTAL MEDIA MILEAGE
PHP 1.2 BILLION

Outcome 1

R&D Program Addressing Micronutrient Deficiency

Development and Potential Reversal of Type 2 Diabetes: How Critical is Vitamin A in the Regulation of Insulin Responsiveness and Lipid Homeostasis?

Carl Vincent D. Cabanilla, Johanne B. Guilaran, Ma. Lourdes T. Cumagun, Imelda Angeles-Agdeppa, Ph.D., Michael E. Serafico, Adorie D. Sabenecio, Darlah Marcela S. Leonardo, Myquie Nicole R. De Guzman, Cecilia A. Jimeno, MD, and Georg Lietz

Type 2 diabetes, the most prevalent form of diabetes, is characterized by the body's reduced ability to produce or utilize insulin, a hormone crucial for regulating glucose levels (WHO, 2018). In the Philippines, the national prevalence of diabetes was reported at 7.2% in 2008 (Jimeno et al., 2015). Moreover, the combined prevalence of pre-diabetes and diabetes was approximately 16.1%, indicating a significant burden of these conditions in the Filipino population (DOST-FNRI, 2019). These statistics emphasize the urgency of implementing public health initiatives for the early detection and prevention of diabetes and its associated complications in the country. In addition, recent studies suggest a potential link between retinol (vitamin A) and the development of this condition, but the underlying mechanisms are not yet fully understood.

This study investigated anthropometric indices, body composition, blood biomarkers, pancreatic fat and serum retinol in diabetic and non-diabetic, pre-obese Filipino adults. This case-control study included 26 diabetic patients aged 18-70 years and 26 age and sex-matched controls from San Juan de Dios Hospital, Pasay City. Participants gave written consent and were physically examined and measured for height, weight, and body composition using a bioelectrical impedance analyzer. Blood samples were also collected for different analyses, such as fasting blood glucose (FBG) using a clinical analyzer, glycated hemoglobin (HbA1c) using ion-exchange high-performance liquid chromatography (HPLC), and serum retinol using high-performance liquid chromatography with an ultraviolet detector (HPLC-UV).

Pancreatic fat distribution across the head, body, and tail fractions was measured using magnetic resonance imaging (MRI). The ethical clearance was obtained from both FNRI Institutional Ethics Review Committee (FIERC-2020-016) and San Juan De Dios Educational Foundation, Inc. - Institutional Review Board (SJIRB-2019-0048/E-MED). This study was part of a multi-center collaboration among Newcastle University, Monash University Malaysia, and DOST-FNRI.

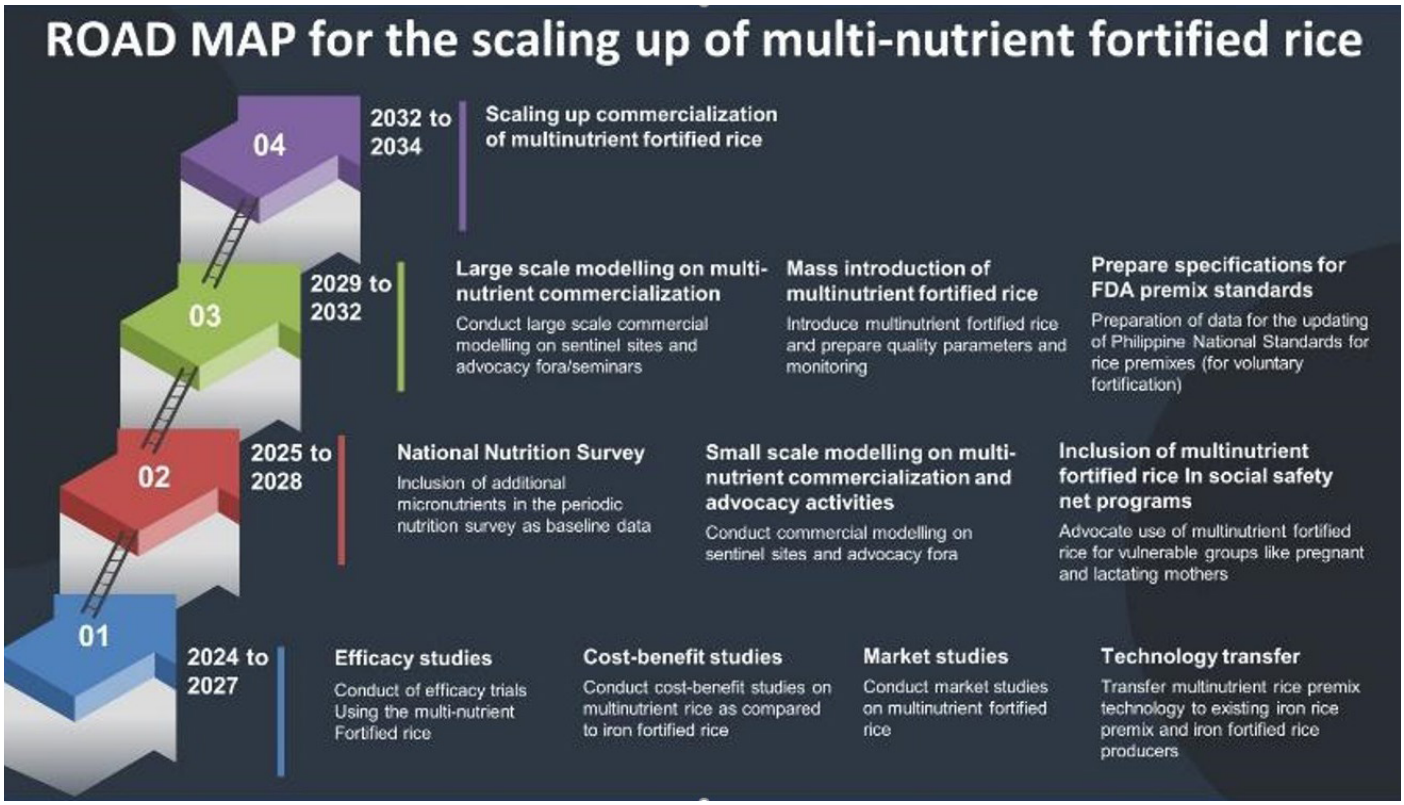
> **Body fat showed an inverse relationship while muscle mass showed a direct relationship with serum retinol.**

The study results between diabetic patients and controls showed statistically significant differences in FBG and HbA1c levels, with p-values of 0.02 and 0.006, respectively. On the other hand, no statistically significant differences were observed in the measurements of body mass index, body fat, muscle mass, total body water, serum retinol, and pancreatic fat between diabetic patients and controls. Results revealed no significant association between body mass index and serum retinol levels across all groups. Body fat exhibited a negative correlation with serum retinol in diabetic individuals ($r = -0.50$), controls ($r = -0.64$), and the combined groups ($r = -0.55$), while muscle mass showed a positive correlation with serum retinol in diabetics ($r = 0.56$), controls ($r = 0.74$), and the combined groups ($r = 0.62$). Additionally, all study groups observed no strong correlations between FBG, HbA1c, pancreatic fat, and serum retinol levels.

The research revealed that, among the parameters studied, only body fat and muscle mass significantly correlate with serum retinol. Specifically, body fat showed an inverse relationship, while muscle mass showed a direct relationship with serum retinol. A randomized controlled trial utilizing a calorie-restricted diet is recommended to better understand the importance of vitamin A metabolism in the development and potential reversal of type 2 diabetes, utilizing the data from the UK, Malaysia, and the Philippines. ■

A Closer Look into the Iron Fortified Rice Distribution Model and its Applicability on the Commercialization of Multi-Nutrient Fortified Rice in the Philippines

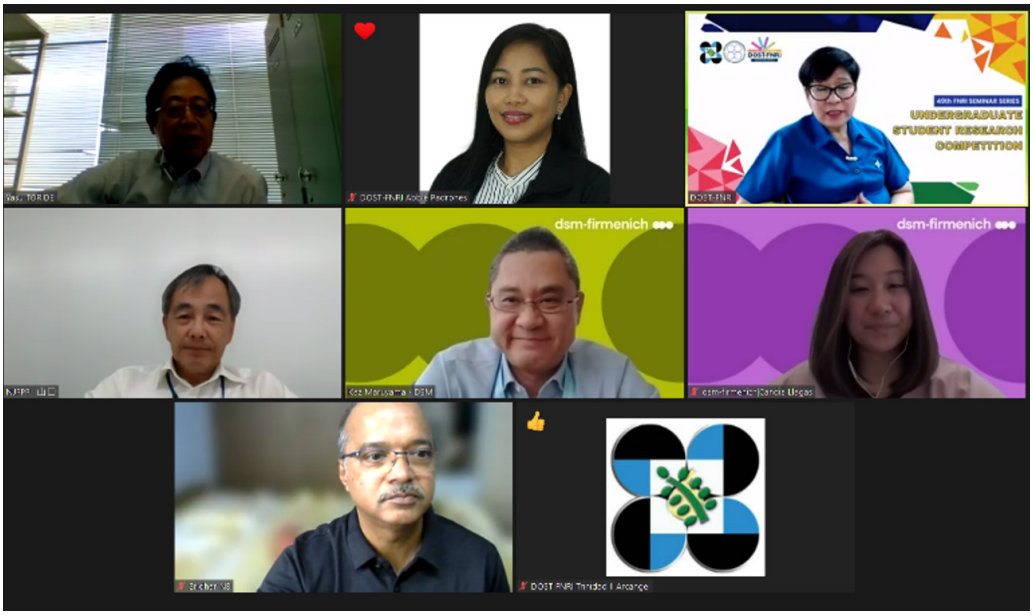
Imelda Angeles-Agdeppa, Ph.D., Abbie L. Padrones, Maricar D. Albao, Trinidad II T. Arcangel, and Engr. Charlie E. Adona



Fortification is the addition of micronutrients in food to prevent or control micronutrient deficiencies in a population. The micronutrients may or may not be originally present in the food product that will be fortified (Liyanage & Hettiarachchi, 2011; Codex Alimentarius, 1991). Research on rice fortification has been conducted by the DOST-FNRI over the years and demonstrated its efficacy as an intervention for micronutrient deficiencies. DOST-FNRI trained local producers on the iron fortified rice (IFR) technology through technology transfer licensing, supply the IFR needed in nationwide feeding under the social safety net programs such as the Department of Education (DepEd) School-Based Feeding Program (SBFP), and Department of Social Welfare and Development (DSWD) Supplementary Feeding Program (SFP).

Current innovations on IFR include adding multiple micronutrients to address micronutrient deficiencies (e.g. zinc and folic acid deficiency) reported in the National Nutrition Surveys (NNS). Various studies have been conducted globally on multinutrient fortified rice (MFR), and it is already commercially available. However, there are no studies on the applicability of the IFR distribution model to the use of MFR in the Philippines. The International Life Sciences Institute (ILSI) - Japan, as part of their support in the scale-up of MFR, funded the project focusing on literature review and preparation of an operational roadmap for the MFR.

The research team prepared a comprehensive literature review on the application, commercialization, financial feasibility of using MFR and an operational roadmap for its scale up. Literature reviews were conducted focusing on existing IFR supply chain in the Philippines, acceptability of multi-micronutrient fortified rice and micronutrient deficiencies among



different population groups. Sources included terminal reports on previous DOST-FNRI completed studies, licensing agreements with technology licensees, and monitoring reports. External sources focused on rice fortification and its supply and demand which were extracted from different databases including those from the Department of Trade and Industry (DTI), Philippine Statistics Authority (PSA), Department of Health (DOH), Food and Drug Administration (FDA), National Nutrition Council (NNC), Department of Agriculture (DA), and National Food Authority (NFA). Literature from different search engines like Google Scholar, PubMed, and Google Books were also used.

All references and data were collected, screened, and analyzed. The project team discussed the merits of the selected references, and only those that were relevant to the context of the project were used in the reports. The initial written report was submitted and reviewed by the ILSI-Japan and their comments were incorporated in the revised final report.

Based on the reviews conducted, experiences in the scale-up of IFR may be applied in the commercialization of MFR using the same distribution channels and supply chain. There is a need for strong partnerships between key stakeholders and synchronized efforts to sustain the use of fortified rice. Commitments from rice industry and consumer awareness may also prove beneficial in sustained use of fortified rice. A shift to multi micronutrient fortified rice from the IFR may incur additional cost, wherein the cost difference is attributed to the cost of the added micronutrients, assuming that the same equipment and fixed assets are used. Regulatory requirements for the registration of MFR may be based on the standards for the iron rice premix as stated in FDA Circular 2007-010-A (Updated standards for iron rice premix amending Bureau Circular 2007-010).

A ten-year roadmap for the commercialization of the MFR may be based on the experiences from the scale-up of IFR which included efficacy trials, market trials, distribution modelling, advocacy activities, and large-scale modelling. The team recommends continuous studies on the activities identified in the road map and collaborate with key stakeholders. It is also important to align and coordinate activities with the existing rice fortification program in the Philippines for a smoother shift from IFR to MFR. Knowledge on the challenges, implementation and structure of the fortified rice supply chain can be used in planning an efficient program for a successful and sustainable commercialization of MFR. ■

“A ten-year roadmap for the commercialization of the MFR may be based on the experiences from the scale-up of IFR which included efficacy trials, market trials, distribution modelling, advocacy activities, and large-scale modelling.”

R&D Program Addressing Macronutrient Deficiencies

Unlocking the Impact of Rice on Gut Health – An Initial Exploration

Amster Fei P. Baquiran, Diana Glades D. Ronquillo, Melissa S. Borlagdan, Fritz Benedict V. Villacarlos, Charlotte Anne G. Dolores, Adorie D. Sabenecio, Asuncion C. Torres, Jahn Philip R. De Leon, and Aida C. Mallillin

In the last decade, dietary management for diabetes and other related conditions transitioned from carbohydrate restriction to prioritizing carbohydrate quality. Glycemic Index (GI) became a key indicator, with low-GI diets associated with reduced diabetes risk.

GI is a numerical value denoting how blood glucose responds after consuming carbohydrate-rich food, in comparison to that of a food or beverage with similar available carbohydrate. The Philippines, being heavily reliant on rice, faces a challenge with high-GI rice varieties since rice is known to be composed mostly of easily digestible forms of starch. Non-digestible carbohydrates may be present in rice bran, which is removed during milling, but partially retained in semi-polished brown rice. For this reason, studies showed more benefits of consuming brown rice or undermilled rice over well-milled counterparts.

With the growing demand for brown rice, more evidence is required to understand underlying mechanisms of regulating blood glucose level. A human study was initiated by DOST-FNRI to investigate the effects of dietary fiber and non-digestible carbohydrates in stabilized brown rice and pre-identified low-GI rice on gut microbiota.

Previous studies revealed roles of gut microbiota in modulating biological responses as they interact with the foods consumed by the individual. The two-phase project, funded by the DOST Philippine Council for Health Research and Development (DOST-PCHRD), aimed to confirm the GI of selected rice varieties using in vivo method and to determine the changes in gut microbiota and fecal short-chain fatty acid (SCFA) of free-living individuals for a six-week intervention.

The first phase of the project compared the biochemical responses upon consumption of stabilized brown rice and its well-milled counterpart. Prior to intervention, proximate composition and dietary fiber were measured in both rice samples. Brown rice contains lower carbohydrates, higher fats, and slightly lower protein than white rice. As expected, total dietary fiber in cooked brown rice (1.7g/100g) was almost thrice the amount of its well-milled counterpart (0.6g/100g), resulting to lower GI value (71) as compared to its counterpart (78).

> **"Dietary modifications may possibly affect gut microbiota and impact biochemical processes in the body."**

The three abundant SCFAs present in stool samples were acetic acid, propionic acid, and butyric acid. Variations were observed in SCFA profiles either within individuals or among individuals and no specific pattern was observed with time. In addition, there were no distinctions in the SCFA levels across the two groups: brown rice versus white rice eaters. Among the three SCFA, acetic acid has the highest concentration which may be attributed to the abundance of acetic acid producing bacteria, Bacteroides, in gut microbiome of the individuals. It was also observed that the abundance of this type of bacteria gradually increased within the six-week intervention period in the group that consumed brown rice while the abundance remained stagnant in the white rice group. This is just a snapshot of how dietary modifications may possibly affect gut microbiota which could impact biochemical processes in the body.

The same testing will be conducted for the pre-identified low-GI rice in the second phase of the project. Upon completion, this two-phase study may provide the scientific community, policymakers, and other stakeholders, basis for developing nutritional interventions or policies to promote a healthy standard of living especially for those at risk of diabetes, metabolic syndrome, and other related non-communicable diseases. ■

R&D Program Addressing Normal Nutrition and Nutrition-related Diseases: Nutrition in the Life Cycle Program

BE HAPPY, AGE WELL: Results from the Healthy Aging Program for Pinoy (HAPPY) Senior Citizens R&D program

Robby Carlo A. Tan, Kyler Kenn M. Castilla, Hazel T. Lat, David Kenneth C. Mendoza, Michael E. Serafico, Marco Mensink, and Lisette CPGM de Groot

Older adults, aged 60 years and above, comprised 8.6% of the Filipino population in 2020 and this proportion is expected to increase to 16.5% by 2050. One of the distinctive characteristics of aging is the progressive loss of muscle mass and muscle strength which can affect their functional status. Recognizing the integral role of senior citizens in the familial and societal structure of the country, their functional status is of prime importance for them to be able to perform their daily activities.

As such, the DOST-GIA funded the "Healthy Aging Program for Pinoy (HAPPY) Senior Citizens R&D program" with the first project titled, "Relationship of body composition to the functional capacity and quality of life of older Filipinos in selected provinces in the Philippines", was recently concluded.

The project investigated aging via two lenses. Firstly, sarcopenia, an age-related loss of muscle mass and strength, and its relationship with the quality of life of community-dwellers. And secondly, physiology and energy expenditure of older adults was examined using state-of-the-art techniques.

Component 1: Is Quality of Life related to Muscle Mass, Muscle Strength, and Physical Performance of Community-Dwelling Older Filipinos?

Predictors of quality of life in older adults are associated with the physiological processes that accompany aging such as the gradual loss of muscle mass which may develop to a condition known as sarcopenia. The objective of the study is to determine the prevalence of sarcopenia and association of sarcopenia with the quality of life of community-dwelling older adults in selected cities in the Philippines.

A multidisciplinary research team conducted a cross-sectional study from November 2021 to June 2022 in the cities of Tarlac, Tacloban and Davao. A total of 562 community-dwelling Filipino older adults participated in this study. Data on socio-demographic status, health and nutrition, body composition using body impedance analyzer, grip strength measured by a hand-held dynamometer, walk test, and quality of life were collected. The health and nutrition outcomes were grouped according to the muscle mass index, grip strength, and physical performance criteria set by the 2019 Asian Working Group for Sarcopenia.

The study showed that 24.3% of older Filipinos were found to be sarcopenic. Non-

The study revealed that sarcopenia is associated with overall quality of life, particularly in the physical and psychological domains. Sarcopenia needs to be considered in the context of public health particularly in coming up with targeted nutrition and lifestyle interventions for improved functional capacity and quality of life.

sarcopenic older adults had significant increased odds of attaining higher overall scores in the physical health domain (OR 1.61; CI 1.04-2.49), psychological domain (OR 1.87; CI 1.22-2.87), and overall quality of life (OR 1.70; CI 1.10-2.63) than the sarcopenic group.

The study revealed that sarcopenia is associated with overall quality of life, particularly in the physical and psychological domains. Sarcopenia needs to be considered in the context of public health particularly in coming up with targeted nutrition and lifestyle interventions for improved functional capacity and quality of life.

Component 2: Enhancing Healthy Aging: Insights from the Nutrition Physiology Laboratory's Study on Physical Activity and Metabolism among Older Filipinos

The Nutrition Physiology Laboratory of the DOST-FNRI showcases the synergy of four key components of human nutrition research: metabolism, physical activity, body composition, and nutrition. The laboratory will link all four research components using advanced technologies and equipment. Data generated from the laboratory will shed more light on understanding the human body and how nutrition and physical activity contributes to improved health, functionality, and quality of life of older Filipinos.

The laboratory team is composed of registered nutritionist-dietitians, registered radiologic technologist, registered physical therapist, and sports management graduate.

The laboratory was officially launched on May 24, 2022, and following its establishment, a study on the energy cost of selected physical activities among older Filipinos was initiated. The study involved 19 older Filipino adults, aged 60-79 years, residing in Taguig City. Trained DOST-FNRI researchers collected data on their anthropometry, body composition, and energy expenditure. Participants engaged in four different cardiopulmonary exercise routines, including treadmill and self-paced walking, as well as strength and resistance exercises utilizing their body weight and gym equipment. Muscle mass and strength were utilized to classify the participants. The results showed that older adults with low muscle mass and handgrip strength exhibit lower Metabolic Equivalents (METs) during the different exercise routines. ■

For more information on the project, please scan the QR codes below.

Laboratory brochure

Field and Laboratory AVP

Supporting Adolescent Growth in the Philippines: A Pilot Study in Marikina City

Noelle Lyn C. Santos, Marilou L. Madrid, Jason Paolo H. Labrador, Allain Louies P. Dalisay, John Carl L. de Torres, May Ann D. Gironella, Eirene Agustin B. Arnejo, Diana Glades D. Ronquillo, Jacus S. Nacis, Abegail P. Pempeña, Pacita T. Trinidad, and Camile E. Canieso

Adolescence is regarded as a critical period of growth in the life course since it is marked by rapid changes in physical, cognitive, and psychosocial development. Moreover, adolescence is a period in one's life in which the rate of growth increases. Having an adequate diet is needed for adolescents to reach their full development potential, excel in school performance, and be physically active.

To date, there is a scarcity of public health programs specifically targeting the improvement of adolescent nutrition, as existing global health programs for adolescents are mostly focused on resolving problems related to sexual and reproductive health. Furthermore, existing intervention programs mostly focus on improving nutrition for women in their reproductive age as well as the first 1000 days of life. The neglect for this age group is evident since stunted growth and delayed onset of puberty has become common in many regions in the Philippines. Double burden of malnutrition in the forms of stunted growth (26.6%) and rising prevalence of overweight and obesity (10.7%), along with insufficient physical activity (82.7%) have been observed among adolescents in the Philippines as reported in the 2019 Expanded National Nutrition Survey.

New evidence suggests that the adolescent phase may serve as a second 'window of opportunity' for catch-up growth to address stunted growth and wasting caused by undernutrition and micronutrient deficiencies during childhood. Therefore, it is imperative that nutrition interventions targeting this age group be developed and tested especially in the local setting.

In this view, the Supporting Adolescent Growth in the Philippines (SAGIP), a model school-based nutrition intervention program was developed, and pilot tested among selected students with ages between 10 and 14 years old enrolled in a public school in Marikina City in this Phase 2 implementation. The preliminary result of the study can be used to support the conduct of a larger community trial and enhance research protocols and components to ensure reliable and cost-effective data collection techniques.

The SAGIP nutrition intervention program comprised three major components: school-based feeding program (SBFP) with sensory play activities; nutrition and physical awareness activities; and nutrition and health status monitoring.

The SBFP component developed 60 recipes or meals that were standardized to meet about 25% of the energy and macronutrient requirements of individuals aged 10-12 years old. Further, a food safety protocol was developed and standardized.

The participants' engagement to SAGIP was measured through attendance monitoring to the SBFP with sensory play, submission of activity sheets consisting of food hunt discoveries, daily exercises performed, and basic concepts on nutrition and food safety (12 sets distributed on a weekly basis). All Information, Education, and Communication (IEC) materials developed can be further evaluated for integration in the curriculum.

Anthropometric and body composition were assessed using advanced equipment (e.g., bioelectrical impedance analysis and dual x-ray absorptiometry). For dietary assessment, aside from computing the nutrient intake based on food composition tables, a new technique (i.e. DNA metabarcoding) using food DNA in stool as a biomarker was tested to assess diets.

The study was limited by the short duration of the intervention period, a challenge brought about by the transition period from pandemic to normal state. Nonetheless, this situation provided possibilities to involve several institutions in the local area, such as a state college, municipal health office, and barangay or local leaders.

The highlight of results are as follows:

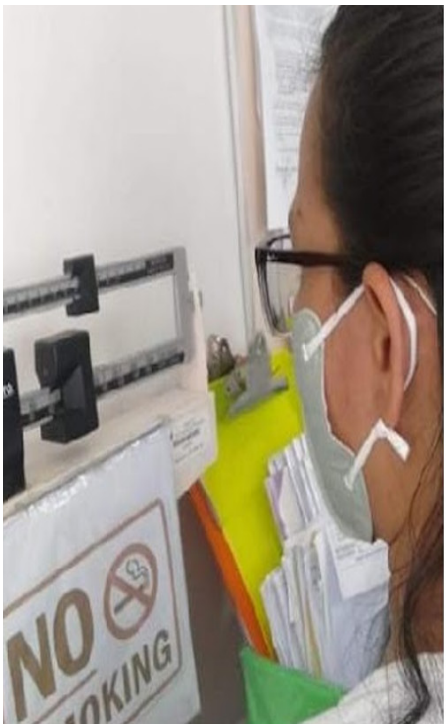
- Mean age of participants was 11.72 ± 1.18 years; with an equal number of males and females;
- About 78.5% engaged in all components of the sensory play - school-based feeding and submission of activity sheets;
- The average cost of meals or recipes was Php 30.52;
- Meals were highly acceptable and well-received by student participants;
- Participation was higher among students with morning class schedules compared to those attending afternoon classes. Overall, the average days of participation to intervention was 46 out of 59 days;
- Increase on the participants' test scores on basic nutrition, food safety, and physical activity awareness was recorded;
- Of the 50 participants, 12% were classified as wasted, 18% were severely wasted, 48% normal, 18% were overweight, and 4% were obese during the baseline period. The proportion of participants with normal nutritional status increased from 48% to 58% at the endline period because of the improvement in the nutrition condition of the "wasted" and "obese" participants.
- Regardless of nutritional status, the body composition of individuals showed a slight increase in fat free mass, fat mass, and bone mass from baseline to endline. Overall, a slight reduction in the fat percentage was observed except among those with normal nutritional status which increased from 18.1% to 18.5%.
- Biochemical parameters such as hemoglobin, serum vitamin A and zinc status were normal for most participants regardless of nutritional status.
- Energy and macronutrient intakes slightly increased at the endline.

"The preliminary result of the study can be used to support the conduct of a larger community trial and enhance research protocols and components to ensure reliable and cost-effective data collection techniques."

This study successfully established standardized protocols which were found to be feasible to proceed to a more extensive school-based trial that would test the effectiveness of SAGIP in improving nutrition status of Filipino adolescents. ■

Maternal Nutritional Status in Early Pregnancy and Gestational Weight Gain of Women in Selected Areas in the Philippines: A Pilot Study

Ruby D. Frane, Charmaine A. Duante, Eva A. Goyena, Ph.D., Marvin C. Delos Santos, Hazel T. Lat, David Kenneth C. Mendoza, Jason Paolo H. Labrador, Merlyn G. Tajan, Tracy Adelaide S. Sanchez, Kristine Marie N. Benavidez-Fabi, Christia S. Padolina, and Imelda Angeles-Agdeppa, Ph.D.



In the Philippines, pregnant women's nutritional status was assessed at any stage of gestation using a standard tool to detect risk of delivering low birth weight infants. However, evidence showed that pre-pregnancy body mass index (BMI) and the gestational weight gain (GWG) are two important determinants of pregnancy outcomes. Hence, this study assessed the nutritional status of Filipino women during early pregnancy and GWG by trimesters and its association with pregnancy and birth outcomes.

Using a prospective study design, 176 Filipino pregnant women, aged 15-49 were recruited from 35 cities and municipalities, and were followed-up between October 2021 to December 2022. Serial weight measurements were recorded in the mother-infant booklet and collected through phone interviews using a structured questionnaire. Weight recorded within the 15 weeks of gestation during the first pre-natal visit was considered as pre-pregnancy weight. Pre-pregnancy weight was classified based on World Health Organization cut-offs. Total GWG, computed as the difference between pre-pregnancy weight and weight of last prenatal visit and assessed based on Institute of Medicine (IOM) recommendations. Pre-pregnancy BMI and GWG with pregnancy outcomes were determined using logistic regression analysis.

Overall, among the study participants, 15.3% were underweight, 56.8% were normal, and 27.8% were overweight or obese. The average gestational age at first prenatal

visit was 9.6 weeks. The mean total GWG obtained was 9.0 ± 4.9 kg across BMI. Notably, mean total GWG varies between BMI categories with highest gain among underweight study participants and lowest gain among overweight or obese group (p value=0.0001). Among underweight and normal-weight group, the mean total GWG were below the IOM recommendations. While among overweight or obese group, the mean total GWG were above the IOM recommendations. The mean rate of weight gain per week was higher in the third trimester than in the second trimester. From all the outcomes studied, being overweight or obese was significantly associated with a higher risk of more than twice having a cesarean delivery [OR 2.85 (95% CI 1.14-7.13, p value=0.025)]. Furthermore, study participants who gained weight below the IOM recommendations had significantly decreased odds for cesarean delivery [OR 0.24 (95% CI 0.09-0.67 p value=0.007)].

In this study, the total GWG was consistent with the previously reported studies in Japan, Thailand and Indonesia showing non-adherence to the 2009 IOM guideline recommendations. This finding suggests that the use of IOM recommendations may not be suitable for assessing the GWG among Asian population including Filipinos.

In this study, the total GWG was consistent with the previously reported studies in Japan, Thailand and Indonesia showing non-adherence to the 2009 IOM guideline recommendations. This finding suggests that the use of IOM recommendations may not be suitable for assessing the GWG among Asian population including Filipinos. Moreover, no significant associations were observed for most of the outcomes except for cesarean delivery among overweight or obese and among participants whose weight gain fell below the IOM recommendations. Hence, it is recommended that a prospective well-designed study is needed to develop appropriate country-specific GWG recommendations to guide Filipino women in prudent weight gain. ■

Determination of Body Composition and Total Energy Expenditure in Filipino Infants and Young Children using Stable Isotope Techniques

Carl Vincent D. Cabanilla, Amster Fei P. Baquiran, Johanne B. Guilaran, Ma. Lourdes T. Cumagun, Roselle C. Sapanghila, Neil M. Tungol, Melissa S. Borlagdan, Aida C. Mallillin, Mary Aguidine F. Ramos, Norman DS. Mendoza, Mario V. Capanzana, Ph.D., and Imelda Angeles-Agdeppa, Ph.D.

Global efforts to enhance nutrition during the critical First 1,000 Days are important in addressing all forms of malnutrition. Recognizing the significance of adequate growth during this timeframe in reducing later health risks, there is a pressing need for comprehensive assessment beyond simple weight and height measurements. While anthropometric measurements provide useful information on growth and nutritional status, weight and height alone do not reflect the "quality" of growth during this vulnerable stage of life. Thus, more comprehensive methods such as body composition (BC) and total energy expenditure (TEE) assessment are needed to better understand growth and its association with later health and development.

A person's body weight comprises fat mass and fat-free mass. Fat-free mass is composed of water, minerals and proteins, and it is assumed that fat mass contains no water. Total body water can be measured by a stable isotope technique. When the total body water is known, which corresponds to the fat-free mass, the fat mass can be estimated. Despite increasing recognition of its importance for life-long health, there needs to be more information on the body composition of infants and young children from low- and middle-income countries. This study assessed the BC and TEE among healthy Filipino older infants and young children using the Deuterium Dilution Technique (DDT) and the Doubly-Labelled Water (DLW) method following the International Atomic Energy Agency (IAEA) research protocols. In addition, this study not only aimed to enhance understanding but also sought to strengthen capacity in using nuclear techniques in nutrition assessments.

The study participants were children 6-23 months of age, full term at birth, healthy, and predominantly/exclusively breastfed for three months and residing at selected barangays of Taguig City. Weight,

> **The nuclear techniques used in this study provided more accurate and precise nutritional assessment data than traditional anthropometric measurements can provide.**

recumbent length, head circumference, mid-upper arm circumference, skinfold thickness, 24-hour dietary intake of participants, and household information were collected from the mothers. To determine BC and TEE, participants were dosed with stable isotopes and provided saliva and urine samples. Dosing involved a one-time administration of deuterium (2H)-labelled water for BC alone and DLW for both BC and TEE, varying by child weight. Deuterium is a stable isotope and therefore non-reactive isotope of hydrogen, one of the components of water (H2O). Saliva samples were collected pre- and post-dosing, and were analyzed for 2H enrichment using Fourier Transform Infrared Spectroscopy at DOST-FNRI. Urine samples were collected pre- and post-dosing by placing collection bags on infants and extracting samples for analysis of 2H and 18O using Isotope-Ratio Mass Spectrometry at the Philippine Nuclear Research Institute. Strict quality assurance measures such as daily instrument calibration and analytical precision checks were implemented to ensure good quality data.

Among the study participants, 27 boys and 27 girls were dosed with deuterium-labelled water while 23 boys and 22 girls were dosed with DLW. BC results revealed that the mean ± SD percent fat mass of the study participants was 25.6 ± 6.2 %, with females (26.1 ± 6.8 %) having a higher percent fat mass than males (25.2 ± 5.7 %). Meanwhile, the mean percent fat-free mass of study participants was 73.6 ± 9.9 %, with males (74.8 ± 5.7 %) having higher percent fat-free mass than females (72.3 ± 12.7 %). The body composition results were consistent with the findings of the IAEA Multicenter Infant Body Composition Reference Study. The TEE of study participants was 671 ± 254 kcal, with males having a higher TEE (691 ± 218 kcal) than females (616 ± 245 kcal). These values align closely with the estimates for TEE derived from the FAO/WHO Expert Consultation based on Butte et al. (2000, 2021, 2025), which analyzed various studies using the DLW method in healthy, well-nourished infants aged 0-12 months and during the first two years of life.

The nuclear techniques used in this study provided more accurate and precise nutritional assessment data than traditional anthropometric measurements can provide. The results can offer valuable insights for developing future interventions to ensure optimal child growth and development in the country. ■

R&D Program on Food Quality and Safety

Detection of *Salmonella* spp. in Retailed Eggs and Broiler Chicken Using PCR-based Assay

Rose Elaine P. Guilaran, Christine Eden C. Sevilla, Elyss G. Billedo,
Denisse Abbie A. Caballes, Paola Bianca M. Buiser, and Mereil O. Garin

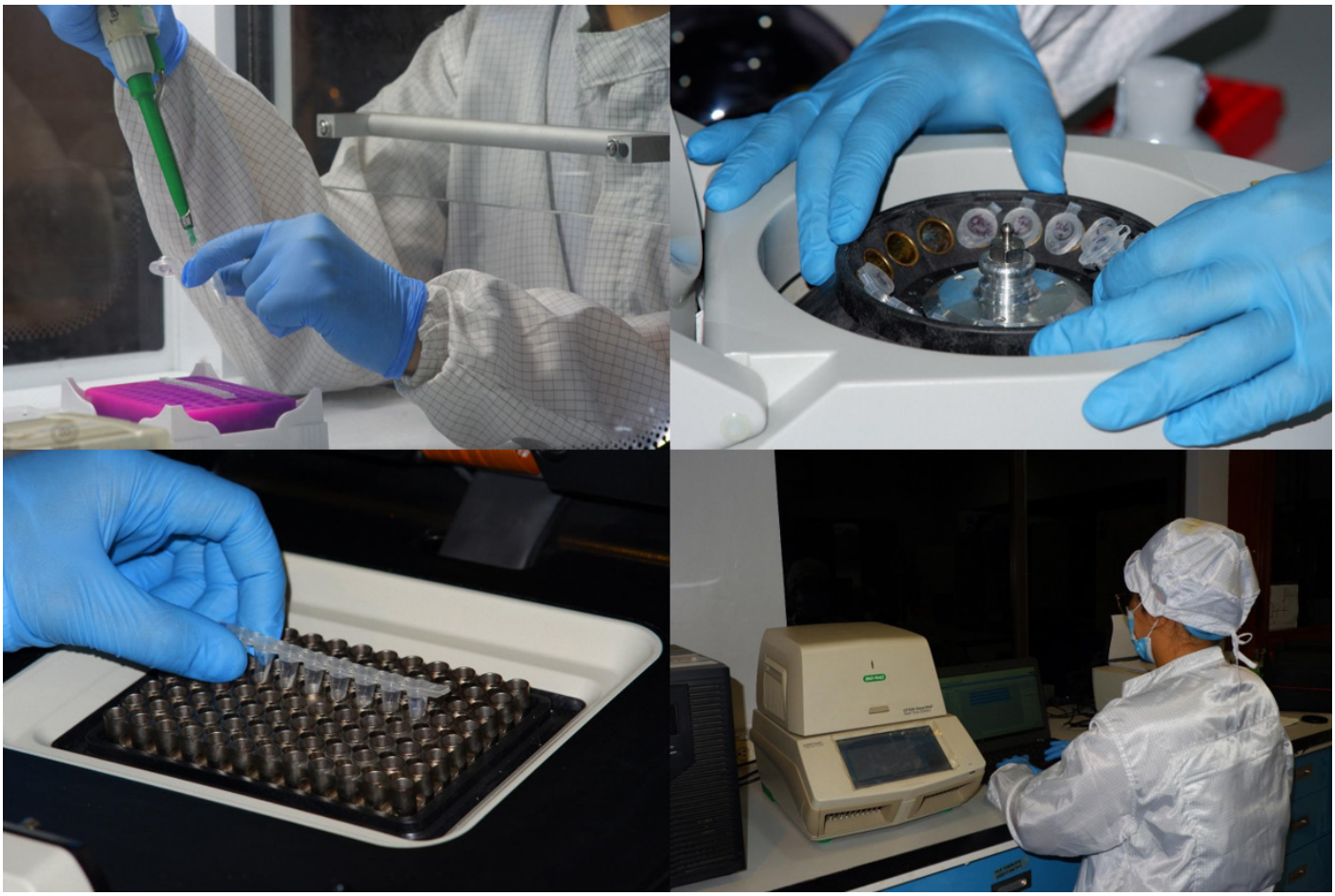


Figure 1. Detection of Salmonella spp. in retail eggs and broiler chicken using real-time PCR

The burden of foodborne diseases remains an important public health concern worldwide. *Salmonella*, a major pathogen linked to foodborne outbreaks, often contaminates eggs and chicken, causing infections usually characterized by the onset of fever, abdominal pain, diarrhea, nausea, and sometimes vomiting. In 2019, according to the Food and Waterborne Diseases Monthly Surveillance Report No. 8 by the Epidemiology Bureau Public Health Surveillance Division of the Department of Health (DOH), about 16,888 typhoid fever cases by *Salmonella* was reported nationwide from January 1 to August 31, 2019.

To better assess the extent and risk of *Salmonella* contamination to the consumers, the study investigated the presence of this pathogen in retail eggs and broiler chickens within the National Capital Region. Real-time Polymerase Chain Reaction (PCR) method, targeting the iagA gene, was employed for *Salmonella* detection. A total of 299 egg and chicken samples were collected from wet markets and supermarkets. Pooled

This real-time PCR approach was used as an effective tool for detecting the presence of Salmonella spp. in chicken and egg samples within three days, thereby demonstrating its potential as a valuable tool for food safety risk assessment.

samples were homogenized, enriched, and subjected to DNA extraction. PCR results were further confirmed using conventional plating method. No *Salmonella* spp. was found present in any of the egg samples. However, a high prevalence (96.7%) was observed in chicken samples. This real-time PCR approach was used as an effective tool for detecting the presence of *Salmonella* spp. in chicken and egg samples within three days, thereby demonstrating its potential as a valuable tool for food safety risk assessment. Notably, the absence of Salmonella in eggs contrasts with the high prevalence in chickens. These findings highlight the need for stricter control measures throughout the poultry production chain to mitigate food safety risks associated with chicken meat consumption. ■

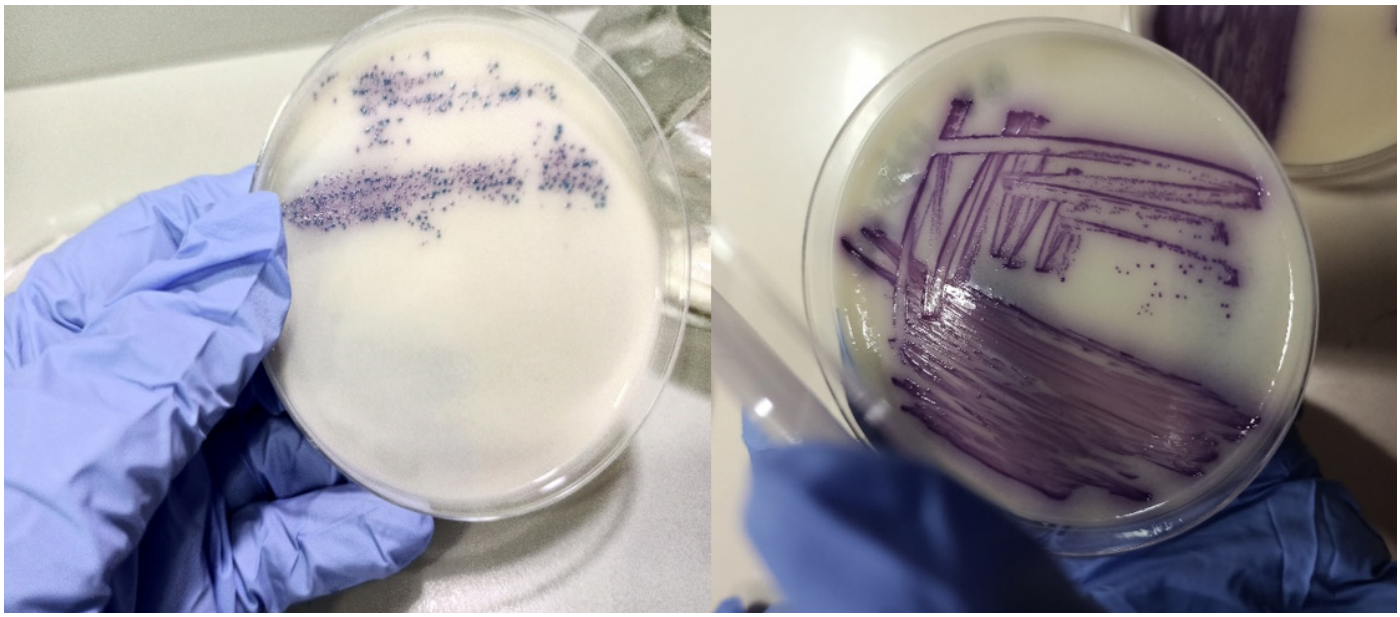


Figure 2. Typical Salmonella spp. colonies appearing in magenta color on RAPID Salmonella Chromogenic Agar

Exposure Assessment of Food Chemical Contamination in Metro Manila: A Pilot Total Diet Study Approach

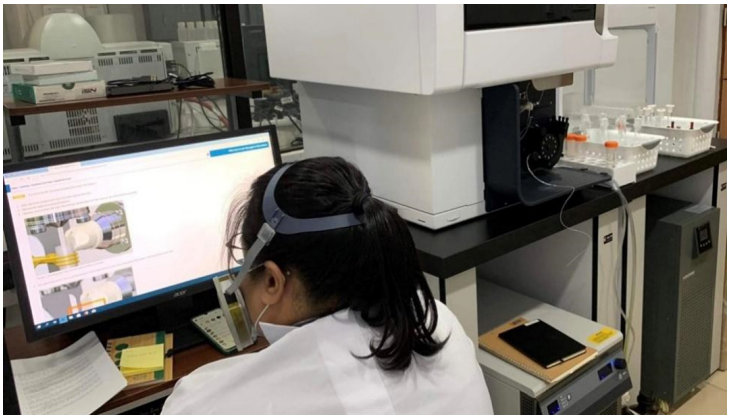
Kristine B. Nacionales, Rose Elaine P. Guilaran, Elyss G. Billedo, Alexandra Lyne E. David, Alyzza Gail M. Del Mundo, Avegail D. Apor, Ma. Ariza C. Baylosis, Aries G. Lundag, and Ron Elyf E. Placio

According to the World Health Organization (WHO), Total Diet Study (TDS) has been recognized internationally as the most cost-efficient way to estimate exposures of consumers to toxic chemicals in food and to assess their associated health risks. There is already numerous TDS data available in other countries. On the other hand, DOST-FNRI took the initiative to conduct the first TDS in the Philippines. The results of a TDS will be used by risk managers to determine whether the Philippine population is at risk with any health and safety concerns. Furthermore, it will aid the regulating government agencies in the development of science-based policies on common and emerging food safety issues.

To date, the Institute was able to prepare the TDS design and protocols which are based on the national food consumption pattern of Filipinos and validated/verified an effective method for the trans-fatty acids (TFAs) and selected minerals in foods using ICP techniques and provided a refined exposure estimate of Filipinos to TFAs and minerals using the established TDS protocols.

Food samples collected for the analysis of TFA and selected minerals were based on the commonly consumed foods using the 2018-2019 Expanded National Nutrition Survey (ENNS)-food consumption data conducted by the DOST-FNRI, Nutrition

> **The DOST-FNRI took the initiative to conduct the first TDS in the Philippines. The results will aid risk managers to determine whether Filipinos are at risk with any health and safety concerns.**



Assessment and Monitoring Division. A series of sample collections were conducted in selected wet markets, supermarkets, and fast-food chains within Metro Manila. A total of 218 pooled food samples for TFA and 59 food samples for minerals (calcium, copper, iron, magnesium, manganese, and zinc) were procured, prepared, and analyzed. The food samples were analyzed by the project team members using ICP-OES for minerals (calcium, copper, iron, magnesium, manganese and zinc) and GC for trans fatty acids (TFA).

Dietary exposure assessment of the Philippine population to TFA and said minerals were also conducted. The data on major food contributors to TFA exposure in the Philippines highlights the need for targeted interventions to reduce TFA consumption, especially among children and adolescents who show significant exposure from processed foods. On the other hand, the data on minerals provides valuable insights into the dietary sources across different age groups, highlighting the significance of specific food items in contributing to overall intake of specific minerals. These findings can inform targeted dietary recommendations and interventions to ensure adequate mineral intake across various life stages. ■

R&D Program on Development of Tools and Guidelines

Enhancement of Philippine Food Composition Tables *(PhilFCT®)* Online Database and Mobile Application

Kristine B. Nacionales, Ma. Ariza C. Baylosis, Rogel L. Villapaz
Alexandra Lyne E. David, and Aries G. Lundag

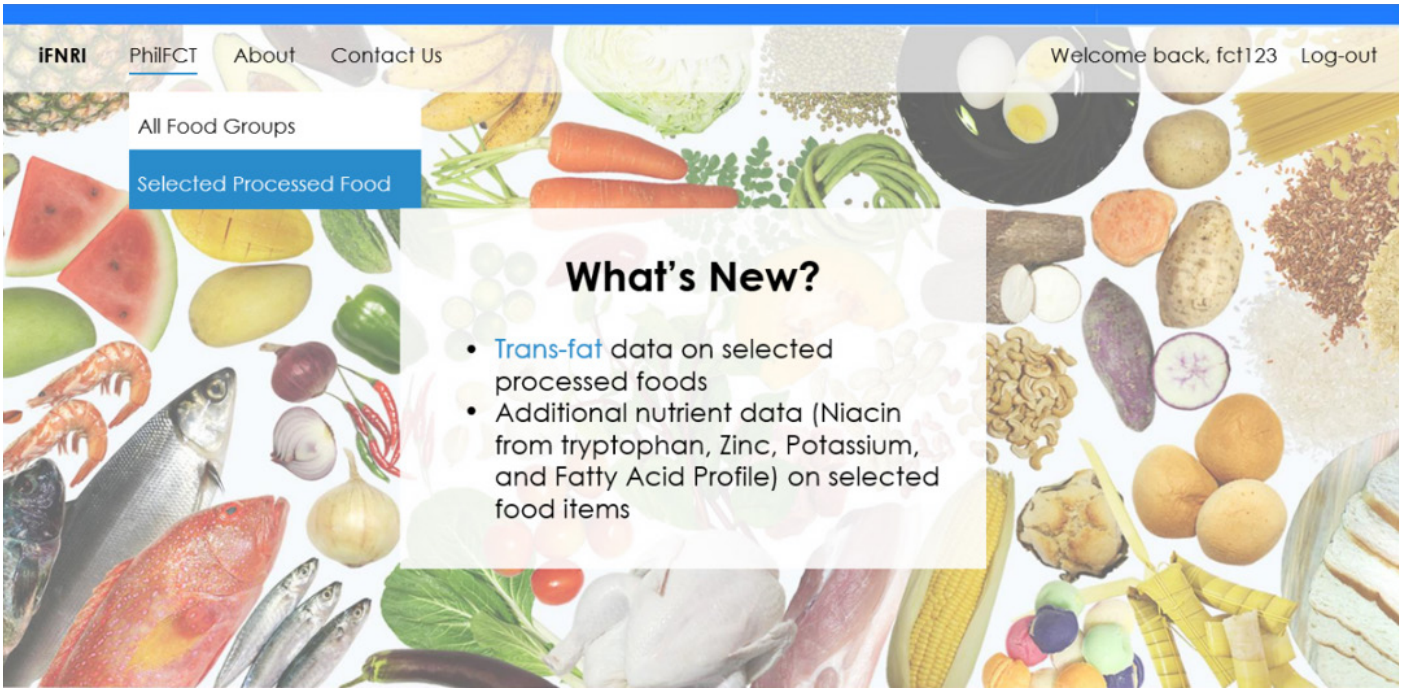
The link between nutrition and health underscores the need for accessible and reliable food composition data. Recognizing this need, the Institute embarked on continuous enhancement and updating of the Philippine Food Composition Tables (*PhilFCT®*) online database and mobile application. The *PhilFCT®* online database and mobile application are the electronic version of food composition tables (FCT) which stores information on the nutritional composition of over 1,500 commonly consumed foods. FCT data are used as a basis for dietary intake assessments, nutritional research, and nutritional epidemiology. It is also used for agricultural research, food formulation, and assessing food biodiversity and food security.

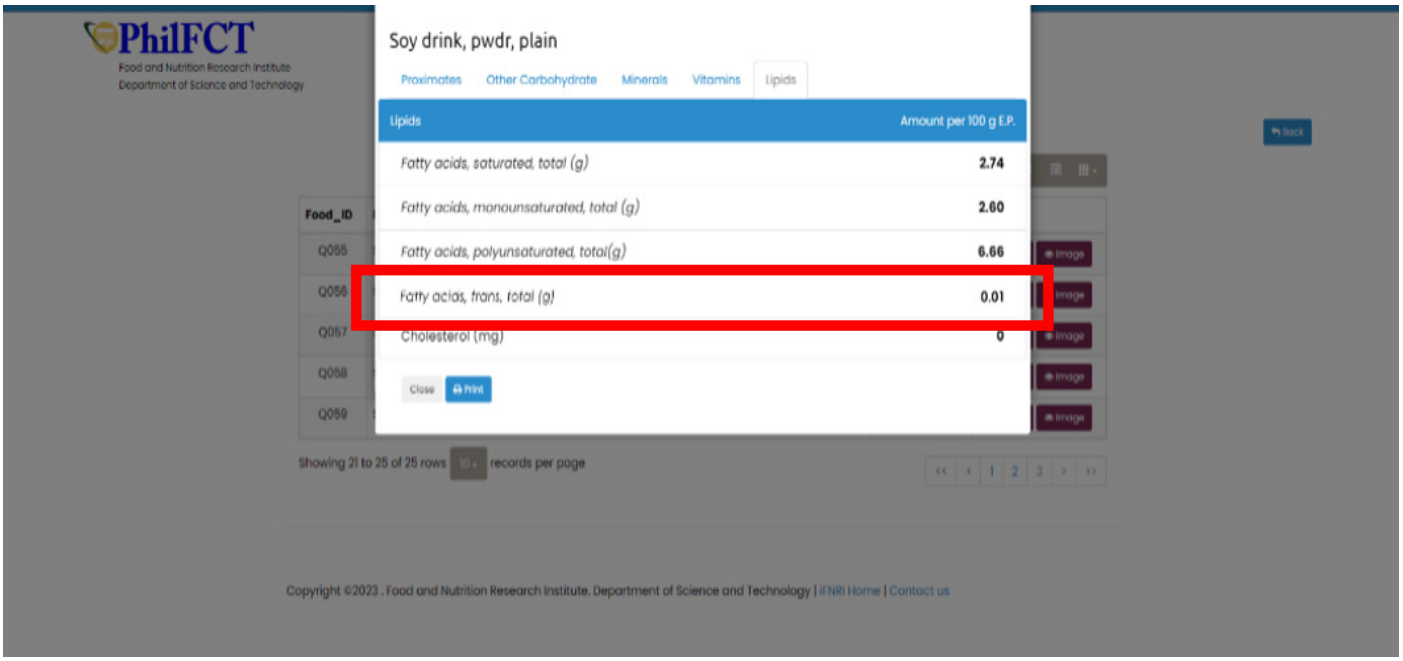
The *PhilFCT®* mobile application was successfully launched on July 5, 2023, during the 49th FNRI Seminar Series. A total of 216 trans fatty acids (TFA) data of selected processed foods were added to the *PhilFCT®* online database. These data were also added to the printable food report of individual food items. These new data on TFA serve as a review of TFA dietary sources and TFA assessment in the food supply that will contribute to the attainment of the Review, Promote, Legislate, Assess, Create awareness, and Enforce (REPLACE) action package of the World Health Organization that aims to eliminate industrially produced TFA. Furthermore, review and enhancement of the database were done continuously to ensure the provision of efficient and user-friendly data. The online database reached 481,452 hits for the year 2023 alone.

The project undertook continuous reviews to enhance its mobile application and online database. Recognizing the improvements in the evolving food landscape and nutritional interests for further improvements in the mobile

application is recommended. Recommendations include updating with additional nutrients like amino acid profile and inclusion of nutrient data for emerging food items. Prioritizing both maintenance (backups, performance optimization) and security enhancements (encryption, patching, incident response planning) of the database are also recommended. The call for international harmonization of food composition databases emphasizes the need for global collaboration, facilitating research and comparisons. Additionally, dissemination efforts are encouraged to inform potential users worldwide about the *PhilFCT®* and other iFNRI components. ■

"Furthermore, review and enhancement of the database were done continuously to ensure the provision of efficient and user-friendly data. The online database reached 481,452 hits for the year 2023 alone."





Healthy Eats Without the Guilt! Delightful DOST-FNRI Recipes and Tools for Filipinos Managing Hypertension

May Ann D. Gironella, Idelia G. Glorioso, Eirene Agustin B. Arnejo, Veronica Vianca C. Salazar, Dexter Y. De Leon, John Mark M. Villanueva, Shannen Faye Q. Arevalo, Erika Niña C. Bacolod, John Denver M. Cabillon, Carissa Saldaña-Tanda, Christelle Lois T. Bayalas, Ma. Corazon E. Palompo, Eva L. Rebato, and Milflor S. Gonzales, Ph.D.

Hypertension, also known as high blood pressure, a condition where the force of blood flowing through the blood vessels is consistently high. It is crucial to detect high blood pressure early to prevent potential health complications. Hypertension is often dubbed the "silent killer" due to its tendency to present no symptoms, yet it heightens the risk for conditions such as heart disease, heart failure, and stroke.

In 2021, the prevalence of hypertension among 20 - 59-year-old Filipinos is 13.5%. Although there was a decrease in the overall prevalence of hypertension, it was noted that the prevalence of hypertension increases with age. Proper diet with healthy lifestyle is important in the management of hypertension and its prevention as well. In an effort to address health and nutrition issues in the country, the DOST-FNRI has developed recipes specifically designed to manage hypertension. These recipes, inspired by regional and popular cuisines, have been adapted to enhance flavor and dietary appropriateness while remaining affordable and easy to prepare. For those diagnosed with hypertension, it is important to control the intake of sodium, saturated fat, and cholesterol, while increasing the consumption of fiber, unsaturated fats, and micronutrients found in fruits, vegetables, whole grains, fish, poultry, and other foods.

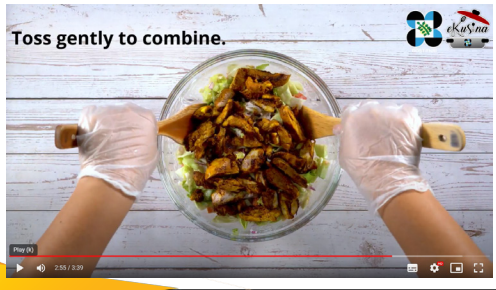
A total of 26 recipes were developed with a serving containing 131–425 calories, 11.4-23.1 g protein, 0.6-10.1 g fiber, substantial micronutrients and limited amounts of saturated fat (< 16.4 g), cholesterol (<107.8 mg) and sodium (< 387 mg). Various cooking methods such as grilling, boiling,

> **These recipes, inspired by regional and popular cuisines, have been adapted to enhance flavor and dietary appropriateness while remaining affordable and easy to prepare.**

steaming, sautéing and pan-frying were used. Seasonings were added in controlled amounts to prevent blandness of the dishes. Marination was done by using spices, fruit juices and vinegar to infuse flavor and help tenderize the meat. Herbs and spices and homemade stocks were used to further enhance the taste while reducing the amount of salt compared to commercially-available products.

The recipes and nutrition messages were incorporated in three nutrition tools: (1) the 2024 DOST-FNRI Menu Guide Calendar, (2) recipe videos coined as "eKusina videos" and (3) online Lutong FNRI recipe booklet. The tools received very satisfactory ratings during the pretesting with experts commending the visually appealing design, precise and understandable content, and simple yet appetizing recipes. The cost per serving of the recipes ranges from Php 13.50 – Php 65.00.

These recipes and nutrition tools serve as invaluable resources for managing hypertension. They emphasize the idea that drastic dietary changes are not necessary; instead, making simple adjustments and adhering to the principles of balance, variety, and moderation can help maintain health while still enjoying meals. ■



A Prediction Model for Low Birth Weight Using Filipino Maternal Characteristics

Ruby D. Frane, Marvin S. Delos Santos, Jason Paolo H. Labrador,
Ma. Anna Rita M. Ramirez, Merlyn G. Tajan, and Erickson Fajiculay

Low birth weight (LBW) is still a persistent problem in the Philippines. An LBW prediction model can be used to make clinical decisions to control LBW, especially in areas with limited access to diagnostic tests.

The study was a secondary analysis of the National Demographics and Health Survey (NDHS) 2022. Overall, 3,814 mothers aged 15-49 who had singleton live births with birth weight data were analyzed. Pre-selection of maternal characteristics were those present before the time of delivery.

Data were cleaned before analysis. The sample dataset was divided into two: 80% (3051/3814) as the training dataset, used to develop the model, and 20% (763/3814), used in the validation and evaluation. Logistic regression was used to predict binary outcomes variables, LBW (<2500 g) coded as "1" and "0" for normal birth weight (NBW, 2500-4000 g) infants.

A univariable regression analysis was conducted to screen for independent predictors of low birth weight (LBW). Bivariable logistic regression was used to assess significant associations between maternal characteristics and LBW. The selection of highly correlated variables, interaction terms, and confounding factors was guided by a literature review and expert opinion. Variables identified as significant in the bivariable analysis were then entered into a multivariable logistic regression modeling with backward elimination, a reduced model to identify predictors of LBW.

The statistical significance level was set at a p-value of <0.05 p-value. The odds ratios and 95% confidence intervals were used to estimate the association between the dependent variable (LBW) and independent variables. The model performance was evaluated using

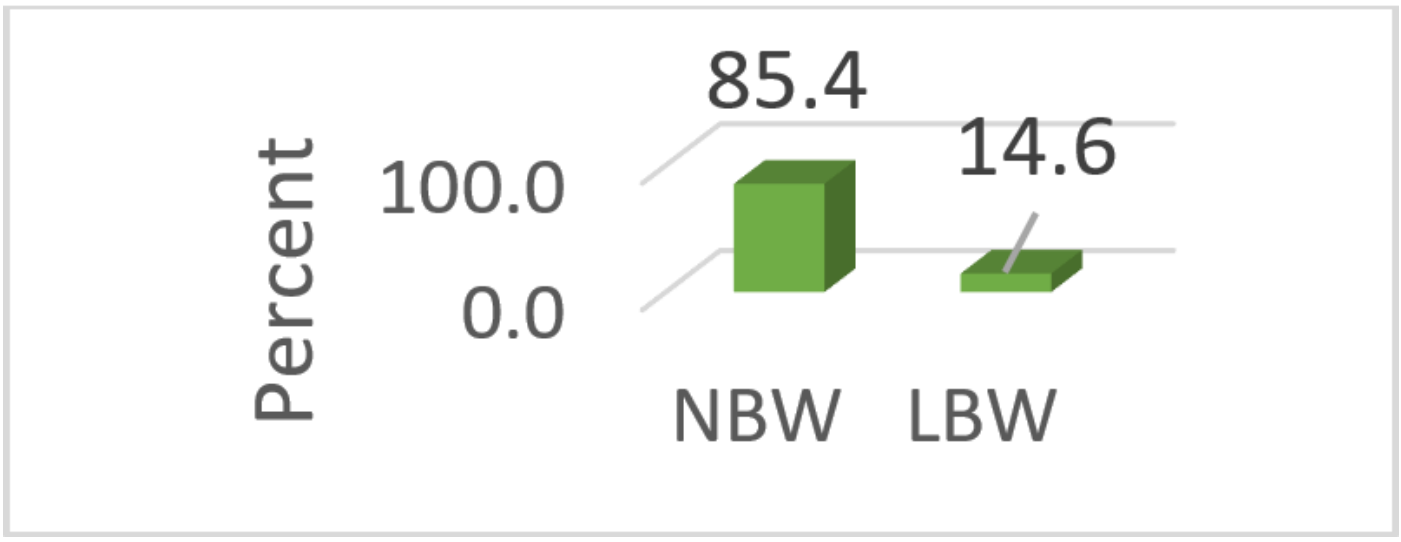


Figure 1. Percentage distribution of mothers by birth weight *(N=3814)*

> **An LBW prediction model can be used to make clinical decisions to control LBW, especially in areas with limited access to diagnostic tests.**

receiver operator characteristics-area under the curve (ROC-AUC), accuracy, sensitivity, specificity, and positive and negative predictive values. All analyses were performed using Python version 3.11.4.

In Figure 1 showed the prevalence of LBW (<2500g) at 14.6%. Logistic regression revealed that age groups 15-19 (OR 1.93, 95% CI 1.23-3.02, p-value= 0.00), and 40-44 (OR 1.53, 95% CI 1.03-2.29, p-value=0.04), listening to the radio less than once a week (OR 1.46, 95% CI 1.13-1.88, p-value=0.00), non-internet users (OR 1.37, 95% CI 1.06-1.77, p-value=0.02), diet groups of plantains, root crops and other tubers (OR 1.27, 95% CI 1.01-1.59, p-value=0.04), and of mangoes, papayas and other fruits (OR 1.32, 95% CI 1.06-1.65, p-value=0.01), and duration of pregnancy (OR 0.67, 95% CI 0.62-0.73, p-value=0.00) were predictors associated with LBW (Table 1). The prediction model has a ROC-AUC of 0.64, with an overall accuracy of 58%, a sensitivity of 59%, a specificity of 58%, a positive predictive value (PPV) of 0.19, and a negative predictive value (NPV) of 0.89. Upon validation, the model exhibited a ROC-AUC of 0.62 and an overall accuracy of 59.1%. Its sensitivity, specificity, PPV, and NPV were 59.4%, 59.1%, 0.19, and 0.90, respectively (Table 2.)

In conclusion, six variables were significantly associated with LBW. A point-based risk score is needed from the developed model so that it can be easily used in clinical and public health practice for decision-making. ■

Table 1. Predictors of LBW

Maternal age (15-19 y/o) and (40-44 y/o)
Listening to the radio less than once a week Non-internet users Had plantains, root crops, and other tubers Had mangoes, papayas, and other fruits Duration of pregnancy

Table 2. Odds ratio of each predictor included in the final model to predict low birthweight

Training Set	ROC-AUC	Overall Accuracy	Sensitivity	Specificity	PPV	NPV
	0.64	58.0%	59.0%	58.0%	0.19	0.89

Development and Validation of Predictive Models of Pregnancy Outcome Using National Nutrition Surveys: Focus on Birthweight

Ma. Anna Rita M. Ramirez, Glen Melvin P. Gironella, and Merlyn G. Tajan

Among the four types of malnutrition (underweight, wasting, stunting and overweight), stunting has gained much attention being chronic in nature as this is generally rooted in poverty. The interest in addressing stunting comes with it the context by which the condition needs to be appreciated and understood. The deleterious effects of poor growth and stunting extend as far back and as far off into the future (James et al, 2000), starting from poor maternal health and pregnancy outcome that could lead to higher risk of developing low birth weight (LBW) among newborns and poor child survival on to non-communicable diseases in adulthood (Barker, 1997). LBW and stunting are shown to be associated as evidenced by studies conducted in underdeveloped and developed countries.

Birth weight significantly influences an infant's survival chances, leading to numerous studies that have explored and established predictive models of LBW using regression statistical techniques. This is particularly relevant as LBW is a common occurrence in developing and underdeveloped countries.

This study employs a machine learning technique, specifically the random forest method, to examine and extrapolate potential risks associated with low birth weight using data from the Philippine nutrition survey. The goal is to provide predictive models of low birth weight for children aged 0-36 and 0-71 months. These models can be utilized in policy programs addressing this aspect of the first 1,000 days in the long term.

Machine Learning

Data mining of big data has shown great potential in data analytics, one of which is machine learning. Machine learning is a tool, that essentially covers the basics of statistical methods & technique using big data.

The study developed and evaluated predictive models of birth weight using the 2018 and 2019 National Nutrition Survey (NNS) data. It identified variables that correlate to birth weight of children; and developed and tested predictive models of birthweight. Number of samples with birthweight (children with ages 0 -71 months old) are presented in Table 1.

A model for another subsample of 0-36 month-old children was analyzed separately for those with maternal component questions, since this component of the NNS, asked questions regarding pre-natal practices of mothers,

Table 1. Data sources: household coverage with data on birthweight among 0 to 71 months old children.

Survey Years	Survey	No. of Households	No. of children with birthweight data
2019	National Nutrition Survey	21,204	17,774
2018	National Nutrition Survey	20,823	16,661

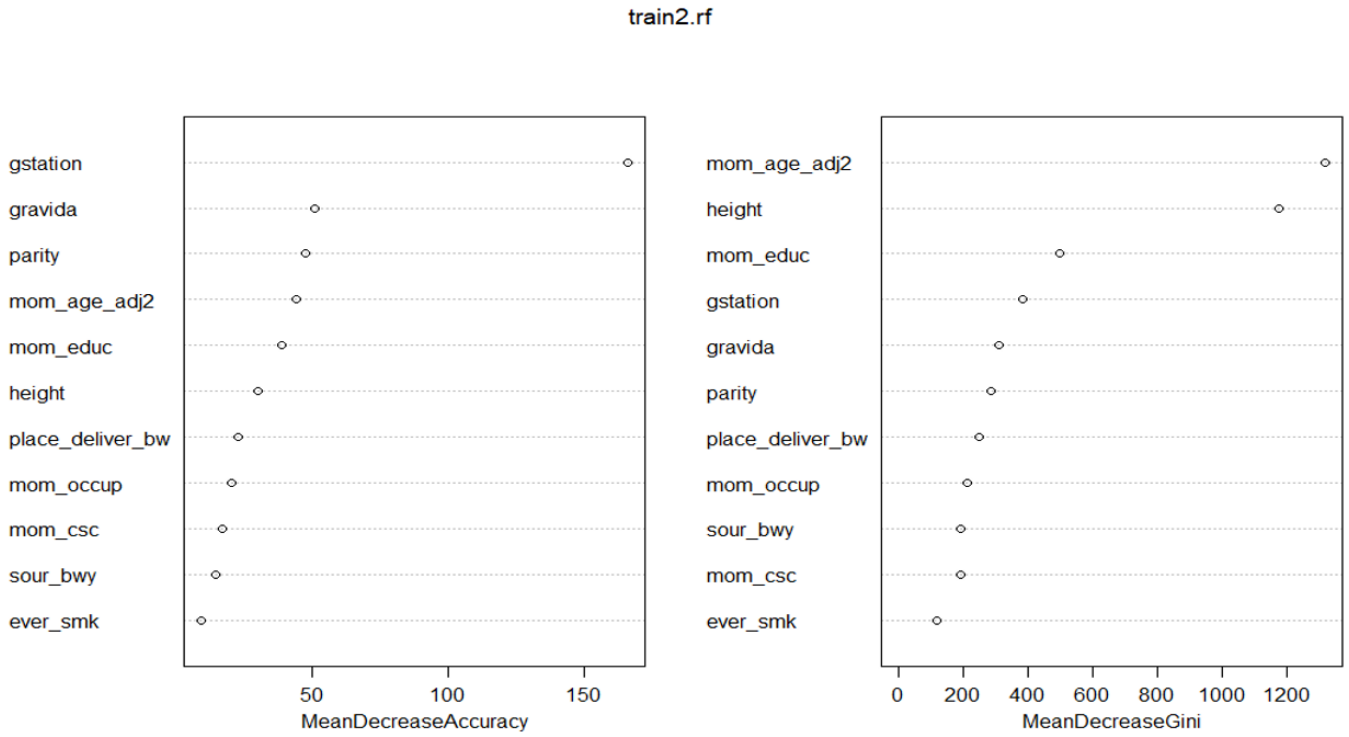


Figure 1. Importance feature using 0-36 month-old children model

among others. Sources of birthweight of the sample children were either recall or records-based.

Variables that predict the low birthweight status of children were determined using variable importance plots. Those variables that are highly correlated are listed on the topmost variables among the variable importance plots using mean decrease accuracy and mean decrease Gini, using the varImpPlot function of randomForest package in R.

Variables that predicted low birthweight of children 0-36 months old are: age of mother, height of mother, education of mother, gestation (or months of pregnancy), gravida (total number of pregnancy), parity (total number of births), place of delivery, occupation of mother, source of birthweight data (records or recall), civil status of mother and if the mother ever smoked (Figure 1). Results show that the out of bag error rate was at 11.9% or the accuracy of the model was at 88.1%.

Variables that predicted low birthweight among children 0-71 months old are: age of mother, height of mother, highest educational attainment of mothers, gravida, parity, place of delivery of child, months of gestation, occupation of mother, civil status of mother, source of birthweight, area in urban, ever smoking, and ever drank alcohol (alcohol). Out of bag error rate of the model among these children was at 12%, or the accuracy of the model was at 88%.

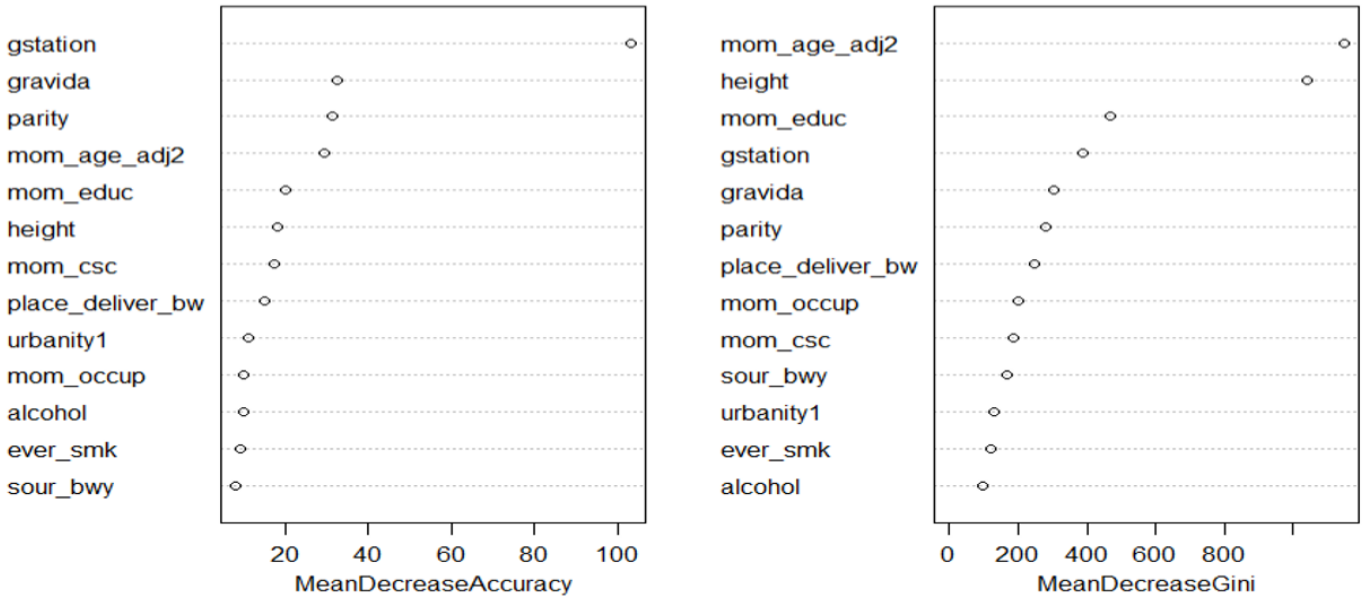


Figure 2. Importance feature using 0–71-month-old children model

Maternal age, height, highest educational attainment, gestation, gravida, parity, place of delivery, maternal occupation, source of birthweight data, maternal civil status, place of residence (urban), history of smoking, history of alcohol were identified as predictors of LBW among Filipino children using random forest machine learning technique. Except for maternal age, height and gestation, all variables are modifiable risks to LBW. A revisit of programs on: education (formal or alternative learning), reproductive health, health infrastructure (Basic Emergency Obstetric and Newborn Care [BEmONC] and sustained health promotion campaigns on smoking and alcohol drinking are recommended. ■

Determining predictive models of low birthweight is a proactive move to address the likely effects of LBW in early life and even in later adulthood.

R&D Program on Food Product Innovation

Development and Pilot-Scale Production of Nutribunnets and Hard Cookies and Reformulation of the DOST-FNRI Enhanced Nutribun for School-Based Feeding Programs (SBFPs)

Engr. Charlie E. Adona, Francesca Louise P. Garcia, Carissa T. Saldaña-Tanda, John Lester G. Ramirez, Engr. Jayson G. Tagaroma, Richard L. Alcaraz, Jonahver O. Tarlit, Filoteo D. Ponte, Rex B. Castante, and Trinidad II T. Arcangel

Malnutrition remains to be a problem among children in the Philippines. According to the results of the Expanded National Nutrition Survey (ENNS) conducted by the DOST-FNRI in 2018, stunting is of high magnitude among pre-school children (2 years old to < 6 years old) while stunting and underweight among schoolchildren (aged 6-10 years old) are public health concerns of high severity. Moreover, the prevalence of wasting among children aged 6-10 years old ranged from 6.4-9.0%.

In 2020, the DOST-FNRI developed the Enhanced Nutribun, a reformulation of the 1970s Nutribun, as one of the government's science-driven solutions to fill the nutrient gap during the pandemic. The Enhanced Nutribun was used by institutional partners as a nutrient-dense food alternative to replace hot meals in the conduct of School-Based Feeding Programs (SBFPs) of the Department of Education (DepEd). As of April 2022, five variants of Enhanced Nutribun have been developed: squash, carrot, yellow sweetpotato, orange sweetpotato, and purple sweetpotato. Each bun weighs approximately 160-165 grams and contains 500 calories and 17 grams of protein.

During the implementation of SBFPs in recent years, concerns have been raised regarding the large serving size of Enhanced

Nutribun. The sodium content also exceeded the recommended amount of less than 200 mg per serving based on DepEd's guidelines. Moreover, the shelf-life of the Enhanced Nutribun – Squash variant is only five days.

Moreover, the DOST-FNRI also initiated the development of new products that will help overcome taste fatigue in children to further increase the diversity of food products available for SBFPs. These include the use of locally sourced ingredients with high nutritional quality and incorporating them in nutritious and palatable bakery-type snack products for children.

"The DOST-FNRI undertook the reformulation of the Enhanced Nutribun to reduce the sodium content, improve the sensory properties, prolong the shelf-life, and decrease the serving size. Nutribunnet and Nutricocokies were also developed to increase product diversity for SBFPs and help overcome taste fatigue in children."

Thus, the DOST-FNRI undertook the reformulation of the Enhanced Nutribun to reduce the sodium content, improve the sensory properties, prolong the shelf life, and decrease the serving size. Nutribunnet (bite-size bun with dark green speckles and filling) and Nutricocokies (crunchy bite-size protein-rich cookies) were also developed to increase the product diversity for SBFPs and help overcome taste fatigue in children.

Formulations and processing parameters were optimized and standardized for the pilot-scale production to ensure process repeatability and product consistency. Data on time and motion study and cost estimates were obtained to evaluate the required productivity and capital investment. The shelf-life study was conducted for 10 days for the Enhanced Nutribun and Nutribunnet and six months for Nutricocokies both at room temperature. During the storage period, samples were analyzed periodically for their physicochemical properties, microbiological safety, and sensory characteristics. The proximate and nutrient composition were also analyzed at the start and end of their shelf-life. A

Parameter	Enhanced Nutribun		Nutribunnet		Nutricocokies	
	Amount per 80-g serving	% RENI	Amount per 80-g serving	% RENI	Amount per 60-g serving	% RENI
Energy (kcal)	242-245	15-16	280	18	283	18
Protein (g)	8-9	19-21	9	21	6	14
Calcium (mg)	128-150	18-21	142	20	37	5
Iron (mg)	3	25-29	2	21	2	15
Zinc (mg)	1	16-19	1	21	0.4	8
Vitamin A (mcg)	166-229	42-57	215	54	111	28

**Percent RENI values are based on 2002 RENI for Male Children 7-9 years old*

five-year financial projection report was also generated to determine the products' financial feasibility.

Results of the study showed that Enhanced Nutribuns and Nutribunnet were microbiologically safe and had acceptable sensory characteristics after 8 days due to the addition of preservatives. The sodium content of the Enhanced Nutribun Squash variant was also reduced from 220 mg to 182 mg per 80-gram serving. Meanwhile, the Nutricocokies was shelf-stable and had acceptable sensory characteristics after 6 months.

The nutrient content and the corresponding percentage of recommended energy and nutrient intakes (RENI) of each serving of Enhanced Nutribun, Nutribunnet, and Nutricocokies based on the requirements of male children aged 7-9 years old are shown in the table below.

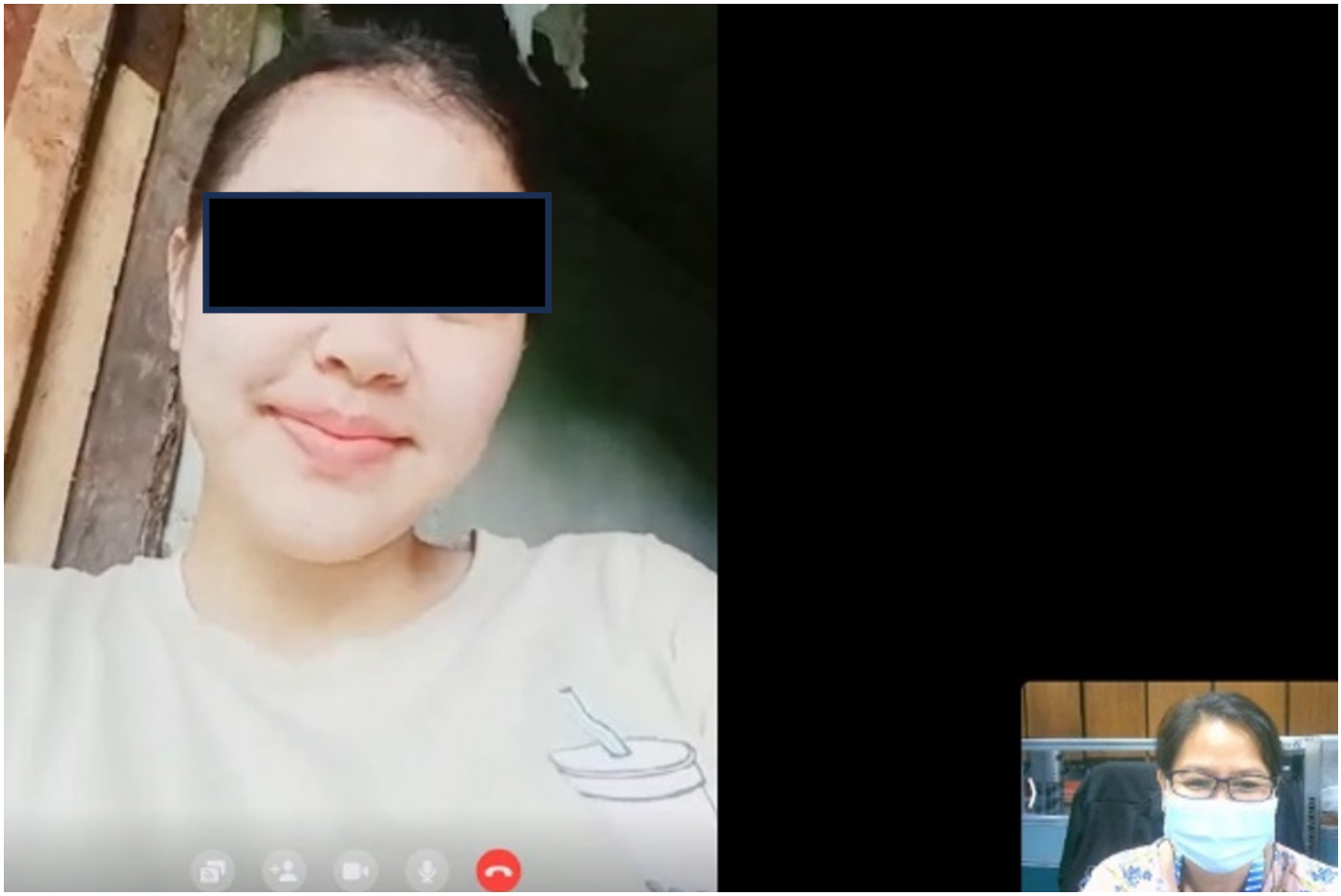
Based on the financial feasibility study of the Enhanced Nutribun variants, for an existing bakery facility, an initial capital of ₱ 878-995K will have a 56.31-67.01% return on investment (ROI) with a payback period of 1-2 years if the product is sold at ₱ 12.27-14.03/80-g pack. For Nutribunnet, the ROI is 49.52% with a payback period of 2.29 years with an initial capital of ₱ 1.03M and selling the product at ₱ 17.47/80-g pack. For Nutricocokies with an initial capital of ₱ 200K and selling the product at ₱ 24.02/60-g pack, the ROI is 212.52% with a payback period of less than one year.

Business venture in the production of Enhanced Nutribun, Nutribunnet, and Hard Cookies proved to be feasible based on the production technology presented in this study. To further reduce production costs and increase profit margin, the use of low-priced but good quality raw materials and higher capacity machines should be considered. ■

Nutritional Assessment and Monitoring Program

A Closer Look at the Situation of Teenage Pregnant Moms in CALABARZON

Emily O. Rongavilla, Joanne Jette S. Gulay, Rowena V. Viajar, Eldridge B. Ferrer, Georgina S. Caraig, and Julieta B. Dorado



Teenage pregnancy is an emerging global problem. In 2022, globally about 13% of adolescent girls and young women below 18 years old gave birth (UNICEF, 2024). Likewise, in the Philippines, about 5% of women aged 15-19 have begun childbearing (PSA,2023).

The study assessed the nutritional status, dietary intake, health seeking practices, and participation to maternal health programs of teenage pregnant women (TPW). This is a cross-sectional survey of households with TPW 10-19 years of age in CALABARZON. The data was collected from June to December 2022. A total of 165 TPW and 28 health implementors as key informants (KI) were interviewed through mobile phone or video calls. The TPW's energy and nutrient intakes were determined using the 2 day 24-hour food recall method.

Results showed that the age of TPW ranged from 13 to 19 years old, with a mean age of 17 years. Half of the TPW were nutritionally-at-risk, 70% had normal blood pressure, 23.9% had pre-hypertension, and 6% were hypertensive. Less than half (41.8%) met the Recommended Energy Intake (REI) while 65% met the Estimated Average Requirement (EAR) for protein. The majority of the TPW were not meeting the EAR for most nutrients such as calcium,

iron, riboflavin, Vitamins A and C. In the interviews conducted among TPW, 64.0% reported participation in the routine pre- and post-natal services, 67.3% followed superstitions, beliefs, and traditions related to pregnancy, and 53.3% had food fallacies (53.3%).

> **The majority of the TPW were not meeting the EAR for most nutrients such, calcium, iron, riboflavin, Vitamin A and C.**

Lack of guidance from the parents or coming from broken family, peer pressure or bad influence of peers, pandemic situation or online classes, high exposure to social media, and rebellious attitude were the factors that may have contributed to the high teenage pregnancies in CALABARZON, as reported by key informants.

With these results, the following recommendations are forwarded to cities and municipalities to help improve the health and nutritional status of TPW: prioritize program with necessary budgetary allocation for the Adolescent Health and Development Program (AHDP) including early detection and location of TPW and regular monitoring of their condition; complete provision of multivitamin supplementation; strengthen nutrition education in the communities; and intensify the sex education in basic education curriculum. ■

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 at present.

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 goals. In the 2019 Expanded National Nutrition Survey (ENNS), three in every ten (10) children under-five years old were stunted. This study assessed the determinant factors of stunting.

The data of 3,684 children aged 1 to <5 years was used 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 used 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.

Findings showed that there were significantly more stunted children observed from the poorest to middle-income groups, among households with more than 5 members, and those with low levels of parental education. Stunted children had significantly lower percentages consuming and lower mean daily intake of Meat and Products, Poultry, Eggs, and Milk and Products than non-stunted children. They also had significantly lower mean intake of protein, iron, calcium, fat, vitamin C, thiamin, riboflavin, niacin, magnesium, zinc, vitamins E and D, and phosphorus (p-value <0.05).

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 were 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 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.

> **"Addressing stunting in the Philippines requires a multifaceted approach that focuses on the underlying determinants of malnutrition while targeting specific dietary needs."**

In conclusion, addressing stunting in the Philippines requires a multifaceted approach that focuses on the underlying determinants of malnutrition while targeting specific dietary needs. Promoting the consumption of nutrient-dense foods particularly high biological value proteins like meat, fish, poultry, milk, and dairy is encouraged to prevent nutritional deficiencies. Strengthening existing maternal and child nutrition programs, and improving access to essential nutrients are crucial steps in this endeavor. Further research is needed to understand the contribution of biomarkers like ucOC and AAs in predicting stunting. ■

Photo grabbed from Dietitians of Canada, 2023. https://www.unlockfood.ca/en/Articles/Protein/Introduction-To-Protein-And-High-Protein-Foods.aspx

The Evaluation of Meal Balance Index among Filipinos: 2018 Expanded National Nutrition Survey Results

Imelda Angeles-Agdeppa, Ph.D., Marvin B. Toledo, Janine Marie S. Dariagan, Fabio Mainardi, Richard G. Cote, Roko Plestina, and Nele Silber

Table 1. Nutrient Content of Exemplary Menu Plans (Halal, Vegetarian, and Usual Filipino Diet)

NUTRIENT	CONTENT
ENERGY	2,063 - 2,145 calories
CARBOHYDRATES	60% of the total caloric requirement
PROTEIN	15% of the total caloric requirement
FAT	25% of the total caloric requirement
SODIUM	2,000-2,300mg
SATURATED FAT	≤ 7% of Total Caloric Requirement
ADDED SUGARS	≤ 10% of Total Caloric Requirement
DAIRY	≥ 1 glass

Dietary pattern defined as the profiling of food and nutrient consumption based on an individual's eating behaviors, has been proven to correlate with one's nutritional status. However, individuals consume a combination of foods such as meals and snacks. Therefore, it would be beneficial to explore the nutritional composition and patterns of meals to examine diet-disease relationships.

In this project, a scoring metric of 0 to 100 was devised by Nestec LTD to assess the nutrient content of meals, which is composed of 9 nutrients (protein, total fat, fiber, potassium, calcium, iron, sodium, added sugars, and saturated fat).

The 2018 NNS food recall data was extracted and analyzed alongside sets of exemplary menu plans for the major existing dietary patterns in the Philippines (omnivorous or standard, vegetarian, and halal).

As per calculated results, the average Meal Balance Index (MBI) score of exemplary menu plans is 72.2 while the data in NNS food recall has a score of 46.1 out of 100. In the NNS data, calcium, fiber, Vitamin C, and total fat were outside the healthy ranges throughout the meals. While in the exemplary menu plans, these nutrients are nutritionally-balanced with high adherence to the dietary guidelines.

Based on these findings, the meal quality of Filipino adults is poorly compliant with the existing dietary guidelines. Therefore, the use of tools, such as the MBI, can be used in assessing an individual's quality and quantity of food intake on a per meal basis. This can aid in determining the role of diet in health and nutritional status. ■

Supporting reference: Mainardi F, Drewnowski A, Green H. Personalized Nutrient Profiling of Food Patterns: Nestlé's Nutrition Algorithm Applied to Dietary Intakes from NHANES. Nutrients. 2019 Feb 12;11(2):379. doi: 10.3390/nu11020379. PMID: 30759867; PMCID: PMC6412928.

"The use of tools, such as the MBI, can be used in assessing an individual's quality and quantity of food intake on a per meal basis. This could aid in determining the role of diet in health and nutritional status."

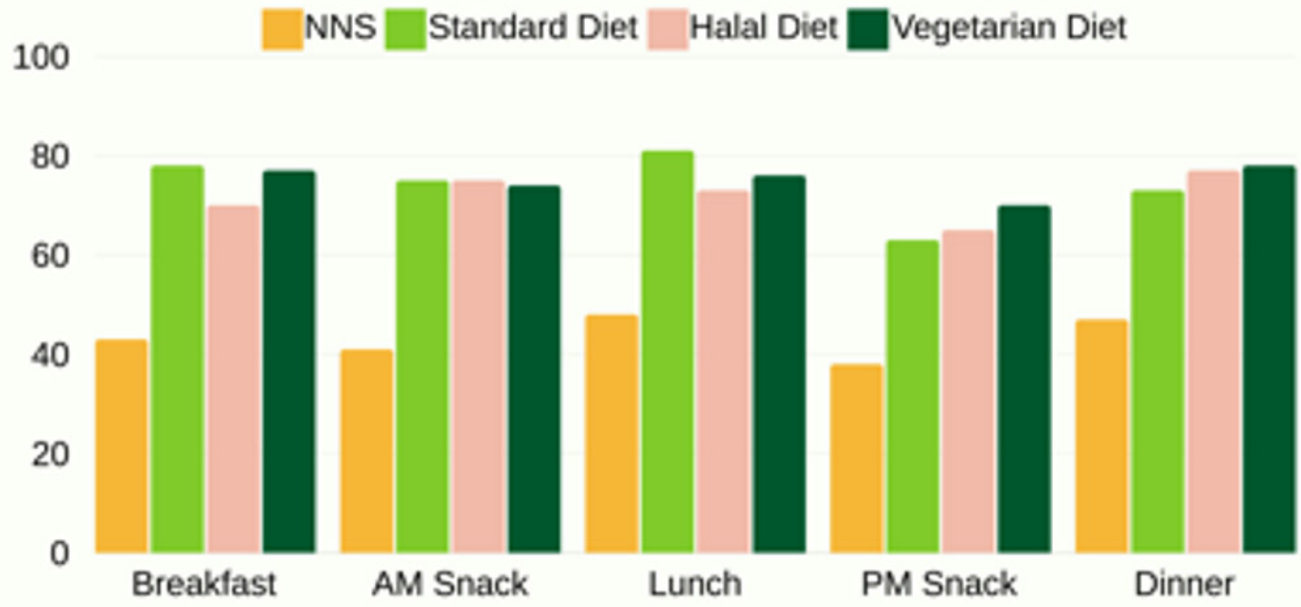


Figure 1. Comparison of Meal Balance Index (MBI) scores

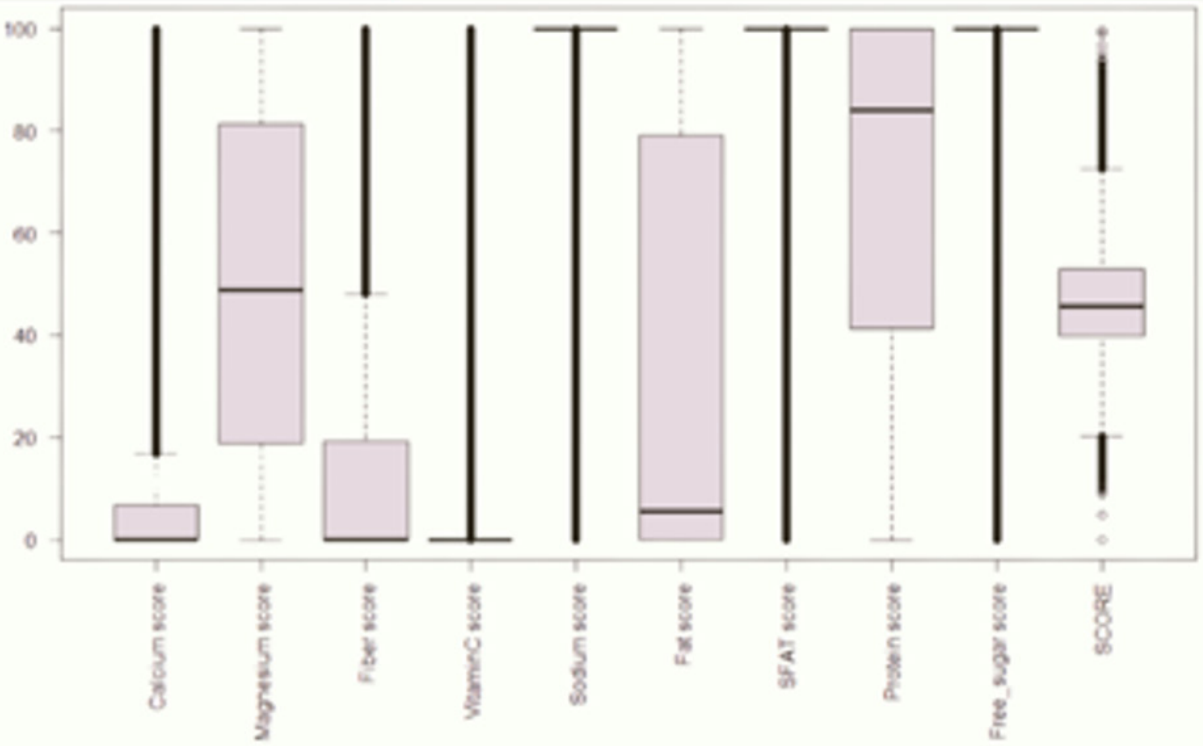


Figure 2. Distribution of Total Scores per Nutrient Intake of the NNS food recall

Snacking Pattern of Filipino Children and Its Contribution to their Total Energy Intake

Michael E. Serafico, Eva A. Goyena, Ph.D., Josie P. Desnacido, and Apple Joy D. Ducay

Snacking can be defined as eating outside the three main meals in a day, regardless of the amount or type of foods consumed. Snacking patterns vary between developing and developed countries and among nations from east to west of the globe. Consequently, proportion of individuals who snack and the energy and nutrient contributions from snacking differ.

This study determined the snacking patterns of Filipino children and its contribution to their total energy intake.

It used secondary, cross-sectional data from two survey years of the Expanded National Nutrition Survey (ENNS) conducted in 2018 and 2019. The 2018-2019 ENNS covered 79 provinces including highly urbanized cities (HUCs). A total of 62,877 children aged 3-18 years old who participated in the 2018-2019 ENNS were included in the study. Around 50% were female while 57.7% resided in rural areas.

On the average, Filipino children consume snacks once a day, usually as afternoon snack. Frequency of snacking between male and female children did not differ significantly. Moreover, consumption of snack foods decreases as the age of children increases. The snack foods frequently consumed are composed of breads and crackers with sugar-sweetened beverages, which contributed around 216.7 kcal of energy for the day.

Figure 1 presents the ten most commonly consumed snack food items by age group. Disaggregating by age group, snack foods covered 26.1% of the total daily energy intake for Filipino children aged 3-5, 19.5% among 6-9 years old, 15.8% for 10-12 years old, 13.8% among 13-15 years old, and 13.4% among 16-18 years old.

Figure 2 illustrates the energy contribution of snack food by food category per age group.

Further studies are recommended to explore whether changes in national regulations on food labeling and marketing and influence of food environments can modify these snacking patterns. ■

“On the average, Filipino children consume snacks once a day, usually as afternoon snack. Frequency of snacking between male and female children did not differ significantly.”

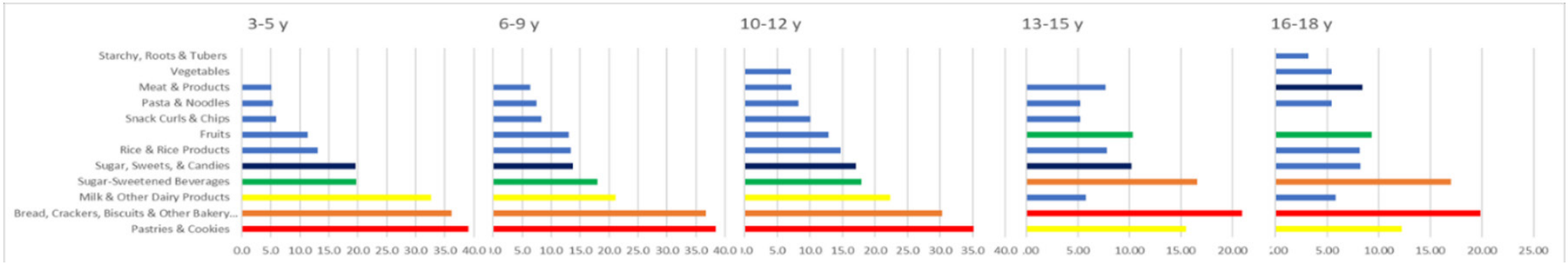


Figure 1. Top 10 most commonly consumed snack food by age group

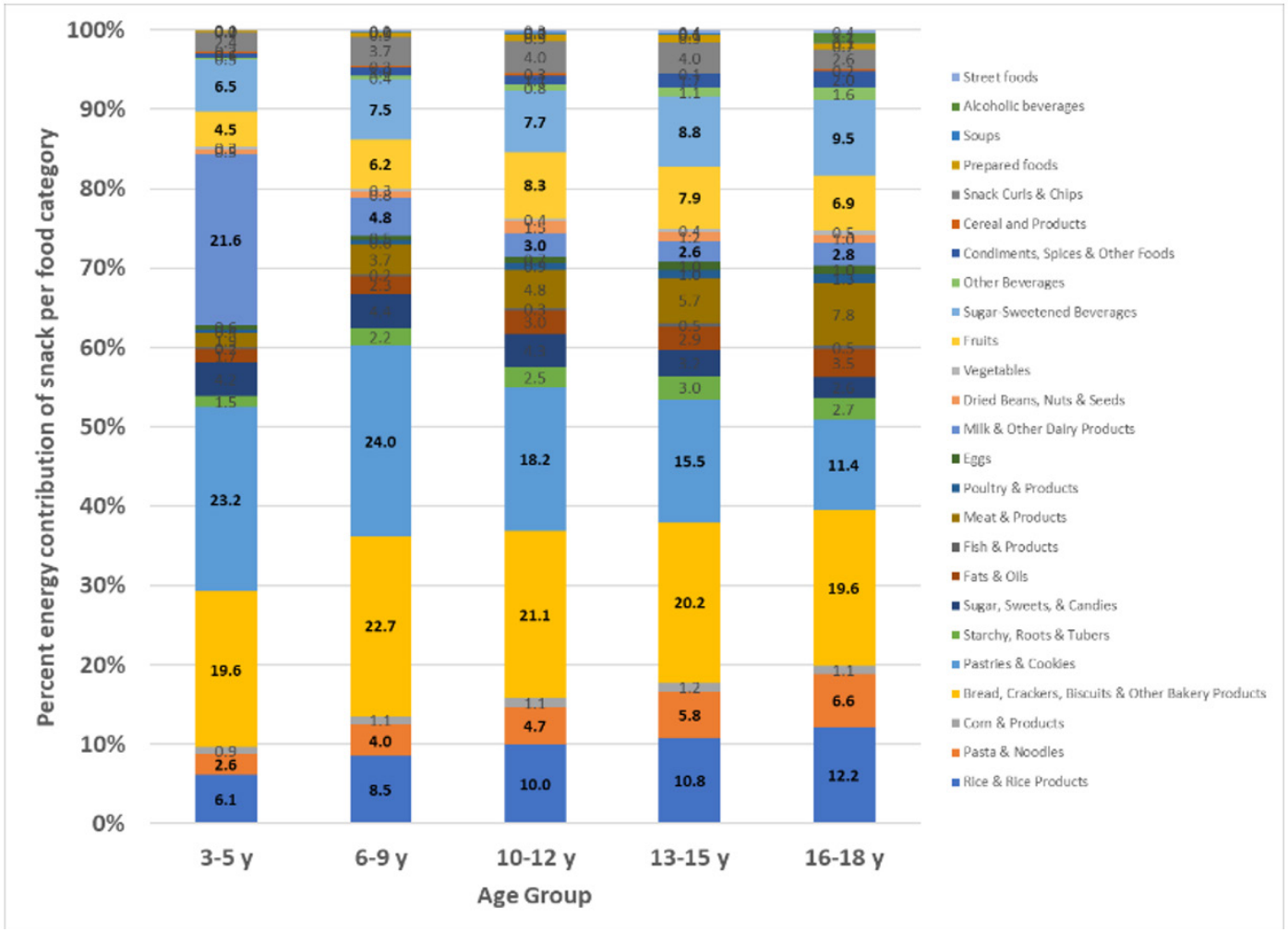


Figure 2. Energy contributions of snack foods consumed per food category by age group

R&D Program on Intervention and Policy Studies

Strengthening the Link Towards Better Nutrition

Marie T. Bugas, Ph.D., Rowena V. Viajar, Emily O. Rongavilla, Georgina S. Caraig, Joanne Jette S. Gulay, Nesrianne G. Buyco, Maricel C. Muga, and Mildred O. Guirindola, Ph.D.

The "Project Results to Policy Recommendations (PR to PR): The Link" is a continuing project of the Nutritional Assessment and Monitoring Division - Nutrition Intervention, Evaluation and Policy Section (NAMD- NIEPS) since 2014. Starting with the crafting of policy statements based on completed research and projects of the Institute, the reach of research findings widens through dissemination of these policy statements not only to the concerned personnel of the Senate and Congress but also to various National Government Agencies and members of the Provincial Nutrition Committees.

In 2023, eleven (11) policy statements were developed with topics on: double and triple burden of malnutrition; food security of school-age children during the pandemic; adolescents' growth; teenage pregnancy; exercises for seniors; Pinoy breakfast; fortified biscuits; nutrition in emergencies; elevated blood pressure and fasting blood glucose; and model delivery system.

The project also compiled policies where DOST, DOST-FNRI, and its studies and data were cited and used. This year, there were additional citations in 12 Senate Bills (SBs), 11 House Bills (HBs), one Memorandum Circular from the Department of Education and one Resolution from the Regional Development Council of Region X. To date, there are already citations in three Republic Acts (RAs), 127 Senate Bills and Resolutions, 157 House Bills and Resolutions, 13 Administrative Orders, six Department Orders, two Memorandum Circulars, and seven Resolutions totaling to 315 policies.

> **Starting with the crafting of policy statements from completed research and projects of the Institute, the reach of research findings widens through dissemination of these policy statements not only to the concerned personnel of the Senate and Congress but also to various National Government Agencies and members of the Provincial Nutrition Committees.**

Specifically, the additional SBs with citations were on: Nutrition Labeling, Salt Industry Development, Anti-Obesity, National Feeding Program, National Agricultural Crop Program, Integrated Urban Agriculture, Philippine Center for Diseases Prevention and Control (CDC), and Electronic Health System and Services. On the other hand, the HBs were on: Pantawid Pamilyang Pilipino Program, Zero Hunger, Reducing and Recycling Food Wastes, Disaster Food Bank, Salt Iodization, Senior Citizens' Discounts, Barangay Integrated Development Approach for Nutrition Improvement (BIDANI) Program, and Promotion of Malunggay. The Department Order was on the School-Based Feeding Program (SBFP) while the Committee Resolution was on Trans Fatty Acids.

Since crafting policy statements and recommendations is now targeted as a project output, the NAMD-NIEPS developed the Terms of Reference and process flow to raise staff awareness. These are as follows: 1) NAMD-NIEPS prepares the policy statement and recommendation (PSR); 2) NAMD-NIEPS incorporates inputs from recently completed researches or projects from other Divisions or Sections; and 3) Other Divisions or Sections prepare the PSR.

As crafting policy statements is a part of the research process in the Institute, let us welcome this project with a new name: **"Strengthening the Development and Dissemination of Policy Recommendations Towards Better Nutrition."** ■

In-depth and Correlation Studies

Descriptive Epidemiology of Diabetes and Pre-Diabetes in the Philippines in the Last Two Decades

Charmaine A. Duante, Cheder D. Sumangue, Apple Joy D. Ducay,
Chona F. Patalen, Catherine M. Iranzo, and Ma. Lilibeth P. Dasco

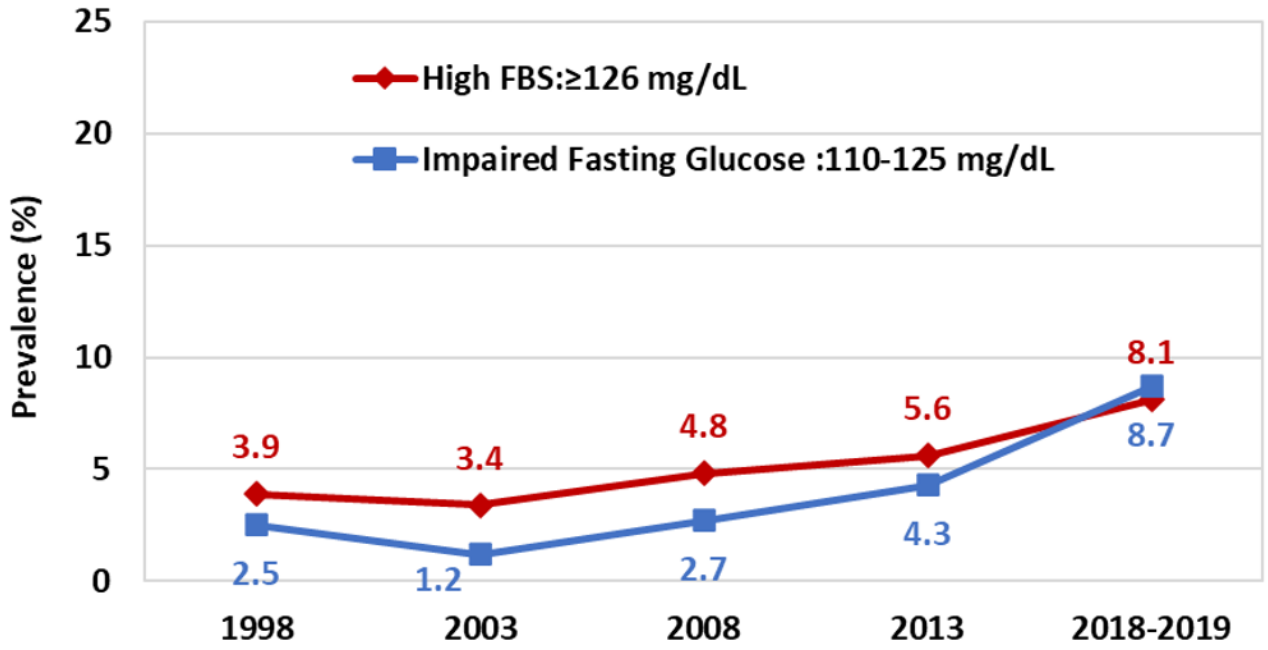


Figure 1. Trend in the prevalence of impaired fasting glucose and high fasting blood glucose among adults, 20 years old and above: Philippines, 1998 to 2018-2019

Diabetes mellitus is a chronic and progressive metabolic disease characterized by abnormally high blood glucose levels. It is a major cause of death, morbidity, and healthcare expenses worldwide. According to the Philippine Statistics Authority (2022), it is the 4th leading cause of mortality among Filipinos.

Understanding the epidemiology of this disease will lead to more comprehensive mechanisms to monitor and avoid the onset of complications as well as other comorbidities. Hence, this study determined the epidemiology of diabetes mellitus and pre-diabetes among Filipino adults in the last two decades, from 1998 to 2018.

The study analyzed cross-sectional secondary data of Filipino adults aged 20 years and above, obtained from the 1998 National Nutrition Survey (NNS) to the 2018-2019 Expanded National Nutrition Survey (ENNS). The data included anthropometric, dietary, and clinical data such as blood sugar and lipid levels. Only sample households with complete data were included in the study.

Findings indicate that the prevalence of high fasting blood glucose (FBG) or diabetes and impaired FBG or pre-diabetes generally increased in the Philippines during the last two decades (Figure 1). The majority or 61 out of the 79 areas surveyed in 2018-2019 had diabetes prevalence ranging from 5.0-9.9% while 60 out of the 79 areas surveyed had prediabetes prevalence also ranging from 5.0-9.9%. The highest prevalence was observed among older adults aged 50-59 and 60-69 years for diabetes and among 60 years and over for prediabetes. During the 20-year survey period, the percentage of persons with diabetes and impaired FBG doubled

and more than tripled among males and females, respectively. Impaired FBG was also significantly higher among males than females in 2013.

The prevalence of diabetes and prediabetes in adults varied by region across different survey years. Among regions with available data in 1998 and 2013, the three regions with high prevalences of diabetes were Region III (Central Luzon), National Capital Region (NCR), and Region IV-A (CALABARZON). On the other hand, the three regions with high prevalences of impaired FBG were CALABARZON, NCR, and Region V (Bicol) in 1998 whereas it differed in 2013 with Central Luzon, Region V-B (MIMAROPA), and Region II (Cagayan Valley) having the highest prevalence. In the 2018-2019 ENNS, data from the 79 provinces and Highly Urbanized Cities (HUCs) surveyed showed that diabetes was more prevalent among adults in Navotas City, Pasig City, and Angeles City, whereas prediabetes was more common among adults in Ilocos Norte, Nueva Ecija, and Parañaque City than in other provinces and HUCs.

In recent years, there has been a significant increase in the number of adults who are overweight or obese, particularly among females. Additionally, the percentage of overweight and obese adults with diabetes has also increased in 2018-2019. Research has shown a weak yet positive correlation between being overweight or obese and having prediabetic and diabetic conditions. The same research also found that adults with diabetes and who are overweight or obese consume significantly more sugar compared to those who are not diabetic or overweight or obese. Having high level of blood lipids is one of the risk factors for diabetes. Blood lipids include "bad" cholesterol or low-density-lipoprotein (LDL), "good" cholesterol or high-density-lipoprotein (HDL), and triglycerides. Various studies have linked low HDL levels and high triglyceride levels to an increased risk of developing cardiovascular disease (CVD) and diabetes. The prevalence of high total cholesterol significantly increased in 2013 and was more common among female adults than male adults. More than half of adults had low HDL-cholesterol in the 2003, 2008, and 2013 survey years and the highest percentage was observed in the 2008 NNS. Concurrently, the prevalence of high LDL-cholesterol and high triglycerides among adults continuously increased from the 1998 to 2013 survey.

With these key findings, it is concluded that diabetes and prediabetes were more prevalent among older adults. In the 20-year survey period, the prevalence of diabetes and prediabetes significantly increased two-fold both among males and females. Health strategies and programs aimed at improving nutrition and health, and preventing the development of diabetes and other comorbidities among people with prediabetes and those at risk must be crafted and/or restructured to address this pressing concern of rising diabetes and prediabetes in the country. ■

"The highest prevalence of diabetes and prediabetes was observed among older adults and the prevalence doubled among males and females during the 20-year survey period."

The Association between Food Security and Food Cost among Filipino Households

Patricia Isabel G. Amita

https://media.philstar.com/photos/2023/01/02/infla_2023-01-02_19-30-26.jpg

According to the Food and Agriculture Organization (FAO, 2002), food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for active and healthy life. Providing food within the household has always been a global challenge. Around 820 million people face hunger daily and more than two billion people lack vital micronutrients, affecting their health and life expectancy. In the Philippines, as in many other nations, food insecurity poses significant challenges, impacting households' ability to access nutritious foods. In the 2018-2019 Expanded National Nutrition Survey (ENNS), more than half (56%) of Filipino families were still suffering from food insecurity.

Access to a nutritious diet is a fundamental aspect of overall health and well-being; yet access to an adequate and nutritious diet remains a significant challenge for numerous Filipino households, particularly those with limited financial resources. For many households, especially those living below the poverty line, allocating sufficient funds for nutritious meals is a constant challenge. The rising prices of essential food items, coupled with stagnant wages and unemployment, exacerbate the financial strain faced by Filipino families. As a result, individuals and households often resort to cheaper and less nutritious food options to stretch their limited budgets, thus, compromising their dietary quality and overall health.

This study evaluated the relationship between food security and the cost of household consumption by food groups. The study used secondary data from the 2018 ENNS (DOST-FNRI, 2021), which included data on one-day dietary food intake and household food security. A total of 40 provinces and highly urbanized cities (HUCs) were covered in the 2018 ENNS and were included in the analysis. A total of

20,276 households with complete data on socio-demographic characteristics, household food security, and household food consumption were included in the study.

The study revealed that households that were moderately and severely food insecure were found to have higher mean consumption of cereals and cereal products, rice, vegetables, and starchy roots and tubers while having lower mean consumption of fruits, meat, fish, and poultry, as well as milk and milk products, in comparison with food secure households.

In terms of household food expenditure, food-secure households have significantly higher ($P < 0.05$) mean household food costs on animal source foods, milk, and other dairy products, vegetables, fruits, and fats and oils than mild, moderate, and severely food-insecure households. Regarding staple foods, significant differences were also found in the mean household food cost of rice and products. Food insecure households may prioritize purchasing low-cost, calorie-dense foods like rice because it provides a relatively large amount of calories. In addition, food-insecure households showed significantly lower fruit & vegetable expenditure than food-secure households, which suggests a lower dietary variety as food insecurity levels increase.

Household food insecurity was associated with food costs among Filipinos. This is reflected in the higher spending and consumption of calorie-dense foods among Filipino households experiencing moderate and severe food insecurity. This may lead to lower nutrient quality and a higher likelihood of nutrient inadequacy or micronutrient deficiencies in these households.

Household food insecurity was associated with food costs among Filipinos. This is reflected in the higher spending and consumption of calorie-dense foods among Filipino households experiencing moderate and severe food insecurity. This may lead to lower nutrient quality and a higher likelihood of nutrient inadequacy or micronutrient deficiencies in these households. The study's results highlight the urgent need for tailored interventions addressing the various factors influencing food security in the Philippines. Policymakers must prioritize measures to boost economic opportunities, widen educational access, and bolster social assistance programs to effectively combat food insecurity. Moreover, initiatives aimed at making diverse, nutrient-rich foods more affordable and accessible are essential for fostering a fairer and more sustainable food system. ■

https://www.rappler.com/tachyon/2023/09/RicePriceMonitoring_CentralVisayas_CebuCityNewsAndInformation_September102023.jpg?resize=2048%2C1536&zoom=1

Dietary Patterns and their Association to Overweight & Obesity among Filipino Adults: ENNS 2018-2019

Ma. Lilibeth P. Dasco, Ma. Evette B. Misagal, and Apple Joy D. Ducay

Overweight and obesity steadily increase throughout the years worldwide which is influenced by several factors, especially poor dietary intake. More than 1.9 billion adults or 39% were overweight, whereas 13%, or 650 million, were obese (WHO, 2021), placing a greater risk for cardiovascular diseases, diabetes, and non-communicable disease (NCDs) (UNICEF, 2022). Obesity was once considered a problem primarily in high-income and developed countries; however, it is now a rising health concern in low- and middle-income countries (UNICEF, 2022). Overweight and obesity rates in the Philippines have steadily increased from 16.6% in 1993 to 36.6% in 2018-2019 (DOST-FNRI, 2022).

> **"Adults consuming meat, poultry, sugar and syrups, and rice and fish were associated with higher odds of overweight/obesity."**

Despite the knowledge of dietary patterns as a critical factor in the development of overweight and obesity, investigations on the specific dietary patterns and their associations with obesity are lacking. Thus, the DOST-FNRI conducted an in-depth analysis among the 79,530 adults aged 20 years old and above who participated in the Expanded National Nutrition Survey (ENNS) in 2018-2019. The study determined the association between dietary patterns and overweight and obesity among Filipino adults.

The Alternative Healthy Eating Index (AHEI-2010) was used to characterize dietary quality. It was developed as an alternative measure of diet quality to identify the future risk of diet-related chronic disease. The research analysis consists of 10 components. Six components for high intake: 1) vegetables, 2) fruit, 3) whole grains, 4) nuts and legumes, 5) fish, and 6) polyunsaturated fatty acids (PUFA), one component of which moderate intake is recommended: 7) alcohol, and three components that must be limited or avoided: 8) sugar-sweetened drinks and fruit juice, 9) red and processed meat, and 10) sodium. The higher scores from AHEI represent healthier diet intake. Principal component analysis (PCA) was used to identify dietary patterns specific to the adult population. Three major dietary patterns were identified through PCA: 1) meat, poultry, and sugar and syrups pattern (MPSP); 2) rice and fish pattern (RFP) and 3) vegetable pattern (VP).

The mean AHEI-2010 score for adults was 48.5 out of a total possible score of 100, with women scoring 38.7 and men scoring 38.4. Adults following AHEI dietary pattern were more likely to be females, living in rural areas, non-smokers, and non-alcoholic drinkers. MPSP respondents were more likely to be young to middle-aged adults (20-49 years old), males from the rich and richest wealth quintiles, and non-smokers. Those who were classified in RFP were more likely to be young to middle-aged adults, males, from rural areas, and non-smokers. Study participants of the VP were more likely to be from the young to middle-aged

adults and less likely to be non-smokers.

After adjustment for various potential confounding factors, MPSP and RFP were associated with higher odds of overweight/obesity [highest-tertile adjusted odds ratio (AOR) 1.12, 95% Confidence Interval: 1.04-1.20; AOR: 1.18, 95% CI: 1.11-1.27, respectively].

The study provided valuable insights into demographic and lifestyle factors influencing dietary habits and health outcomes. Further research is recommended to explore the relationship between dietary patterns and health, considering other variables. Monitoring dietary trends over time can deepen the understanding of evolving patterns and emerging health challenges. Incorporating qualitative methods alongside quantitative analysis can also provide insights into the barriers influencing dietary choices across populations. This can involve community-based initiatives, educational campaigns, and policy interventions targeting dietary norms, habits, and access to healthy food. This comprehensive approach will improve public health outcomes and reduce the burden of obesity-related diseases. ■

Table 1. Demographic and health characteristics by tertile of the four dietary patterns

Subject characteristics	AHEI-2010	Meat, poultry, and sugar and syrups pattern (MPSP)	Rice and fish pattern (RFP)	Vegetable pattern (VP)
Mean Age (y)	46.6 ± 0.2	41.0 ± 0.2	42.3 ± 0.1	43.6 ± 0.2
20-29 y	17.2 ± 0.4	27.1 ± 0.5	23.3 ± 0.4	21.0 ± 0.5
30-39 y	19.9 ± 0.4	25.2 ± 0.3	24.5 ± 0.4	23.9 ± 0.5
40-49 y	21.6 ± 0.3	21.4 ± 0.4	22.8 ± 0.4	22.4 ± 0.4
50-59 y	20.1 ± 0.4	15.3 ± 0.4	16.9 ± 0.2	17.5 ± 0.3
60 years old and above	21.1 ± 0.4	11.0 ± 0.4	12.4 ± 0.3	15.1 ± 0.3
Gender (%)				
Male	17.2 ± 0.4	27.1 ± 0.5	23.3 ± 0.4	21.0 ± 0.5
Female	19.9 ± 0.4	25.2 ± 0.3	24.5 ± 0.4	23.9 ± 0.5
Place of residence (%)				
Rural	62.8 ± 3.5	46.8 ± 5.3	62.5 ± 3.8	58.4 ± 4.1
Urban	37.2 ± 3.5	53.2 ± 5.3	37.5 ± 3.8	41.6 ± 4.1
Wealth Status (%)				
Poorest	21.6 ± 1.6	9.9 ± 0.9	23.0 ± 1.7	20.9 ± 2.0
Poor	22.7 ± 1.2	16.3 ± 1.1	23.3 ± 1.2	19.7 ± 1.1
Middle	19.9 ± 0.8	21.5 ± 0.5	21.5 ± 0.5	20.4 ± 0.6
Rich	18.8 ± 0.9	26.1 ± 0.9	18.4 ± 1.2	20.3 ± 1.2
Richest	17.0 ± 1.4	26.1 ± 1.6	13.9 ± 1.2	18.7 ± 1.6
Currently smoking (%)	20.2 ± 0.4	23.5 ± 0.6	28.4 ± 0.5	22.6 ± 0.4
Currently drinking alcohol (%)	43.8 ± 1.0	56.8 ± 1.0	55.8 ± 1.3	49.6 ± 1.2
Values are means ± standard errors or percentages				

Table 2. Multivariate adjusted odds ratio for Overweight/Obesity by tertiles of four dietary patterns

MODELS	Bivariate Logistic Regression (BLR)						Multivariate Logistic Regression (MLR)					
	Unadjusted Odds ratio	SE	t	p-value	95% CI		Adjusted Odds ratio	SE	t	p-value	95% CI	
					LL	UL					LL	UL
Model 1 - AHEI-2010												
T1	reference						reference					
T2	0.94	0.02	-2.78	0.014	0.89	0.98	1.00	0.03	0.05	0.959	0.95	1.06
T3	0.95	0.03	-1.73	0.104	0.89	1.01	1.04	0.02	1.62	0.126	0.99	1.09
Model 2 - MPSP												
T1	reference						reference					
T2	1.27	0.05	6.01	0.000	1.17	1.38	1.04	0.04	0.97	0.346	0.96	1.12
T3	1.47	0.05	10.59	0.000	1.36	1.59	1.12	0.04	3.38	0.004	1.04	1.20
Model 3 - RFP												
T1	reference						reference					
T2	0.97	0.03	-0.99	0.338	0.90	1.04	1.05	0.02	2.34	0.033	1.00	1.10
T3	0.94	0.05	-1.34	0.200	0.84	1.04	1.18	0.04	5.28	0.000	1.11	1.27
Model 4 - VP												
T1	reference						reference					
T2	0.99	0.02	-0.28	0.781	0.94	1.05	0.97	0.02	-1.42	0.177	0.92	1.02
T3	0.97	0.04	-0.70	0.497	0.90	1.06	0.98	0.03	-0.79	0.441	0.91	1.04

AHEI: alternative healthy eating index, MPSP: meat, poultry, and sugar and syrups pattern; RFP: rice and fish pattern; VP: vegetable pattern, T1 tertile 1, T2 tertile 2, T3 tertile 3, ref. reference group. Values are odds ratios (95% confidence intervals). BLR was an unadjusted logistic regression model. MLR was adjusted for age, sex, smoking status, drinking status, urbanity and wealth status

Adult Height and Blood Pressure --- Does A Connection Exist?

Maria Stephanie N. Parani, Chona F. Patalen, Ma. Lynell V. Maniego, Catherine M. Iranzo, Ma. Lilibeth P. Dasco, and Charmaine A. Duante

Lamang ang matangkad, this Filipino expression emphasizes the advantages and better opportunities often associated with being tall. From being easier to spot among the crowd, having better reach, and even potentially earning higher paying salaries (Judge & Cable, 2004) are some of the advantages of being a tall person. However, when it comes to health, does height really matter? In a recent study published in Lancet Diabetes & Endocrinology (2002), a person's risk of dying from heart disease decreased by 6% for every 2.5 inches of height (Stefan et al., 2016), while short adults showed approximately 1.5 times higher risk for cardiovascular morbidity and mortality compared to tall individuals. In the Philippine context, various studies have explored hypertension, one of the major contributing factors for heart disease and its associated risk factors but a notable gap exists in the relationship between height, blood pressure, and hypertension. Thus, this study investigated whether a positive or inverse association exists between height, blood pressure parameters and hypertension among Filipino adults, with males' average height of 163.22 cm (5 feet 4.25 inches) while females' average height of 149.60 cm (4 feet and 10.89 inches) (Bostock & Jankowicz, 2023).

This study used the data collected from the 2018-2019 Expanded National Nutrition Survey conducted by the DOST-FNRI. Adults, 20 years old and above with complete data on anthropometric measurements, blood pressure measurements, socio-economic and demographic characteristics, lifestyle factors, and biochemical data were included in the study. The measured heights of the participants were categorized into sex-specific quartiles.

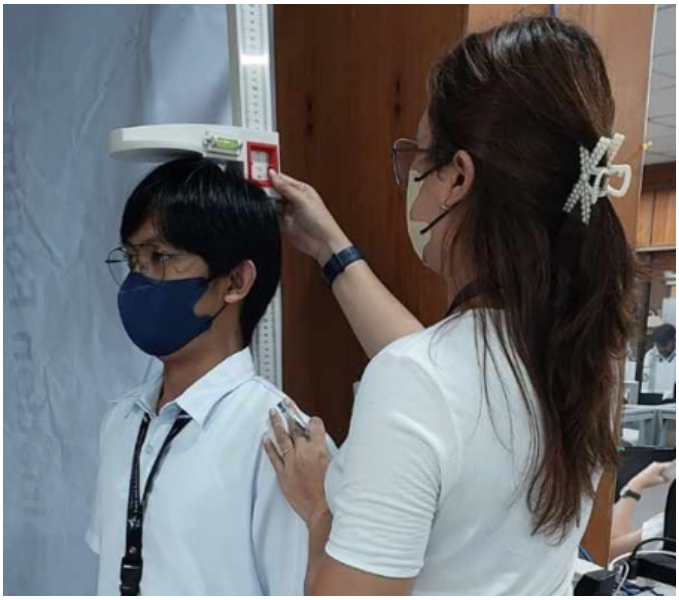
Looking at the blood pressure-stature pattern among Filipino adults, the systolic blood pressure (SBP) in both men and women participants decreases as their height increases while the diastolic blood pressure (DBP) increases as the height increases, though the decrease of SBP in men was not statistically significant. Furthermore, an inverse association between height and SBP among men participants with linear change of -0.012 mmHg (95% CI: -0.057 to 0.033) was noted, though not statistically significant. On the

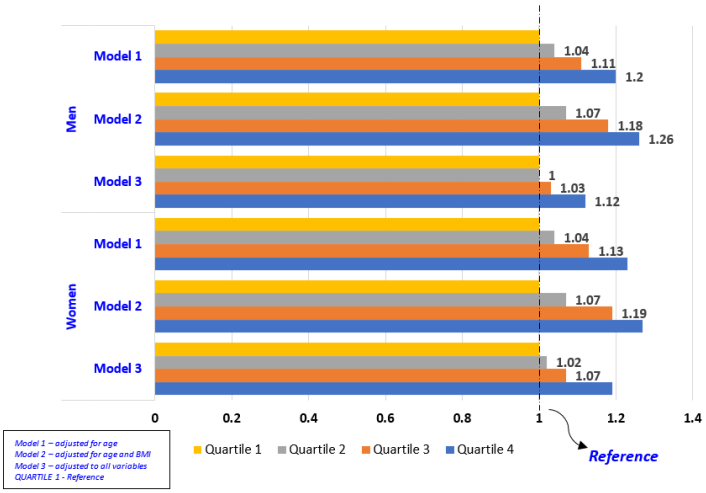
"Looking at the blood pressure-stature pattern among Filipino adults, the systolic blood pressure (SBP) in both men and women participants decrease as their height increases while the diastolic blood pressure (DBP) increases as the height increases.... this might be due to hemodynamic and hydrostatic effects, where short people had a larger reflected wave and SBP than tall people."

other hand, a significant inverse association was found among women participants, wherein a -0.261 mmHg (95% CI -0.309 to -0.213) linear change was observed ($p<0.001$). However, after removing the effect of confounding factors, analyses showed positive associations between height and blood pressure parameters in both sexes.

This study confirmed and extended the findings of several authors where SBP increases and DBP decreases more in people who are short than those who are tall, this might be due to hemodynamic and hydrostatic effects, where short people had a larger reflected wave and SBP than tall people (London et al., 1992) (Bourgeois, et al., 2017). With regards to the differential relationship of blood pressure parameters to height in men and women in this study, the same findings were found in published articles where the height increases the SBP and DBP decreases in women but not for men (Ferrie et al, 2006). This might be due to the larger coronary vessel diameters of taller people compared with shorter people, and for women, they have smaller-caliber coronary arteries than men thus reduced height and being female would have an additive effect on coronary artery disease risk (Stefan et al., 2016).

In addition, the study found no association between being tall to a decreased chance of developing hypertension. However, it was noticeable that the prevalence of hypertension was greater in men than





in women with a relatively decreasing trend of hypertension as the height of the females increases. But on the contrary, a greater likelihood or risk of developing hypertension was found among women. The mechanisms responsible for these blood pressure paths among women were the sustained vascular influence of hypertensive disorders of pregnancy, interactions between the renin-angiotensin-aldosterone system and sex hormone, or even psychosocial gendered factors (Connelly P et al., 2022).

In general, the study provided valuable knowledge that may contribute to the existing data on the connection of height with blood pressure. However it solely focused on the associations between adult height, blood pressure, and hypertension, while lacking other relevant factors such childhood nutrition data and lifestyle habits of the participants. Nutrition during childhood may have an underlying connection with height and subsequently, the development of hypertension in later years. Thus, it is recommended to conduct a longitudinal study including childhood nutrition as well as maternal nutrition during pregnancy to check whether it affects height and the risk of hypertension and possibly CVDs. ■

Is the Food Retail Market Associated with Food Intake and Nutritional Status of Mothers and Children?

Mildred O. Guirindola, Ph.D., Ma. Lynell V. Maniego,
Eva A. Goyena, Ph.D., and Nesrianne G. Buyco

Interview among households in Cavite, Philippines

Food is an integral part of people's health and well-being. "Food is medicine and medicine is food" and "An apple a day keeps the doctor away" are just some of the many clichés about the importance of food in maintaining good health.

However, healthy foods are not always available in homes and communities or are not affordable to many. The limited access to and affordability of fresh and nutritious foods in the food environment, such as in retail food markets and food establishments may compromise people's chances to continue eating a varied and balanced diet.

As a result, child undernutrition, specifically stunting, underweight, wasting, and micronutrient deficiencies remain high. On the other hand, the rising overweight and obesity among children continue to be a concern, especially in low and middle-income countries like the Philippines. Looking at the intergenerational cycle of malnutrition, the persistent problem of the triple burden of malnutrition in the country can be attributed to poor dietary intake of mothers and children (DOST-FNRI, 2022).

The study determined the dietary intake and nutritional status of mothers and children based on the type of retail food environment for buying foods in a peri-urban province in the Philippines. The research was conducted in August 2021, during the latter part of the COVID-19 pandemic, and involved 358 households in Cavite, Philippines. The food retail markets where households purchased their food were categorized as informal, formal, and combination food retail markets. In this study, an informal market was defined as a food retail market made of semi-permanent structures and not regulated through government statutory structures (e.g., sari-sari store, street vendor, talipapa) while a formal food retail market

is one made up of fixed structures and is regulated by the government (e.g., convenience store, supermarket, and grocery stores). Households that purchased from both formal and informal food retail markets were classified as using combination food retail markets.

> **The study found that the most common food retail market for buying foods in the Province of Cavite is a combination retail food environment. In this food retail market, the proportion of mothers and children meeting their minimum dietary diversity (MDD) was found significantly higher.**

The study found that the most common food retail market for buying foods in the Province of Cavite is a combination retail food environment. In this food retail market, the proportion of mothers and children meeting their minimum dietary diversity (MDD) was found significantly higher. In terms of nutritional status, households buying from informal food retail environments had significantly higher rates of chronic energy deficiency (CED) and obese mothers, and wasted children. On the other hand, households buying from the combination food environment had higher rates of underweight and stunted children. Overweight was noted in both mothers and children from households buying in formal food environments.

Based on the findings, it is recommended that further studies be conducted to analyze the connection between food environment with dietary and nutritional outcomes using other dimensions. These studies may consider various aspects of the environment, such as availability, distance, prices and affordability of food, as well as households' perceptions of their local food environment. ■

Interview among households in Cavite, Philippines

How the Pandemic Affected the Food Security and Diet Diversity of Households with and without Migrant Parent Workers

Joanne Jette S. Gulay, Rowena V. Viajar, Georgina S. Caraig, Nesrianne G. Buyco, and Apple Joy D. Ducay

Food security is defined by the Food and Agriculture Organization (FAO, 2002) as a situation when "all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preference and dietary needs for an active and healthy life". Migration is one of the coping mechanisms of households to address food insecurity. The unprecedented situation during the COVID-19 pandemic that lasted for about three years has profound implications for the household's food security and nutrition. During the pandemic, the adoption of migration as a coping mechanism was further heightened to search for food and seek employment opportunities.

"The results served as inputs for policy and programmatic directions regarding the concern that the COVID-19 pandemic influences food security and diet diversity in households with and without migrant parent workers."

This study examined how the pandemic affected the food security and diet diversity of households with migrant and non-migrant parent workers. The research was a cross-sectional survey conducted from October to December 2022. The study participants were primary caregivers in households with 6-9-year-old children from the cities of Caloocan, Malabon, and Navotas in the National Capital Region and municipalities of Atimonan and Padre Burgos in Quezon Province. A total of 88 households were included, 42 with migrant parent workers and 46 with non-migrant parent workers. Interviews on food security and dietary diversity were conducted via phone calls. Food security was determined using the Household Food Insecurity Access Scale. The Statistical Data Analysis (STATA) was used and all tests with a p-value of <0.5 were considered significant.

Results showed that during the pandemic, eight in every 10 households with migrant parent workers and nine in every 10 households with non-migrant parent workers were found to be food insecure. Despite being food insecure, both household groups were able to eat diverse food groups and within acceptable food consumption levels. Both households were significantly food insecure during the pandemic, and their mean dietary diversity scores (See Tables 1 and 2) also significantly increased which may be due to the food assistance provided.

The results served as inputs for policy and programmatic directions regarding the concern that the COVID-19 pandemic influences food security and diet diversity in households with and without migrant parent workers. With this, the provision of additional livelihood to increase household income and local programs such as home food production must be strengthened to increase household food security.

Table 1. Percentage distribution of households by food security status during the pandemic

Food Security Status	Households with migrant parent workers				Households with non-migrant parent workers				P-value
	%	SE	95% CI		%	SE	95% CI		
			LL	UL			LL	UL	
food secure	21.4	6.3	11.3	36.8	6.5	3.6	2.1	18.8	0.042
food insecure	78.6	6.3	63.2	88.7	93.5	3.6	81.2	97.9	0.042
mildly food insecure	19.0	6.1	9.6	34.2	8.7	4.2	3.2	21.5	0.158
moderately food insecure	47.6	7.7	32.8	62.9	43.5	7.3	29.7	58.3	0.697
severely food insecure	11.9	5.0	4.9	26.1	41.3	7.3	27.8	56.3	0.002

Households with migrant parent workers vs. households with non-migrant parent workers during pandemic
**significance at < 0.05*

Table 2. Mean dietary diversity score of households before and during the pandemic

Dietary Diversity Score												
	n	Before pandemic				P-value[1] (before pandemic)	During pandemic				P-value[1] (during pandemic)	P-value[2]
		Mean	SE	95% CI			Mean	SE	95% CI			
				LL	UL				LL	UL		
Households with migrant parent workers	42	9.7	0.3	9.1	10.4		10.9	0.2	10.6	11.3		0.0026
Households with non-migrant parent workers	46	9.3	0.3	8.8	9.9	0.3414	10.4	0.2	9.9	10.8	0.0624	0.0043

[1]Households with migrant parent workers vs. households with non-migrant parent workers;[2] Before and during pandemic
**significance at < 0.05*

Use of Food Frequency Questionnaire to Assess Relationships between Dietary Patterns and NCD Risk Factors

Chona F. Patalen, Josie P. Desnacido, Apple Joy D. Ducay,
Maria Niña Michaela B. Plastina, Antoniette G. Cristobal, and Charmaine A. Duante

Non-communicable diseases (NCDs), also known as chronic diseases, are a major concern worldwide. According to the World Health Organization (WHO, 2018), these diseases are of long duration and result from a combination of genetic, physiological, environmental, and behavioral factors.

Risk factors for NCDs often cluster and interact, and the co-existence has also been shown to influence mortality (Loef and Walach, 2012). These factors that are largely lifestyle and diet-related are overweight and obesity, elevated blood pressure, high fasting blood glucose, and abnormal lipid levels.

An unhealthy diet is one of the major risk factors for NCDs, and assessing it involves measuring food consumption and examining dietary patterns. Measuring food consumption can be done quantitatively or qualitatively.

Hence, it is essential to gain a deeper assessment of the dietary patterns that will aid in understanding their relationships with several NCD risk factors. The food frequency questionnaire (FFQ) is the most widely used dietary assessment tool to obtain information on intake for an extended period. The use of the FFQ is low-cost, easy to administer, and has minimal participant burden. Still, validation of dietary tools, like the FFQ, is needed to generate valid dietary information towards more reliable diet-disease associations.

The semi-quantitative FFQ was administered in the 2013 National Nutrition Survey (NNS) to assess the nutrient intake among adults and the degree of association with selected NCD risk factors.

This study assessed the validity of the FFQ used in the 2013 NNS, by comparing the estimated intakes of cholesterol, dietary fat, and total sugar with total cholesterol, triglyceride, and fasting blood glucose levels among adults, 18 years old and above.

Moreover, the median total energy intake and median intakes of total cholesterol, total fat, sugars, and saturated fatty acids were generated, and intakes were

significantly higher among males than females.

There were two phases conducted in this study, 1) assessment of the correlations between intakes generated from the 24-hour food recall and the FFQ, and 2) assessment of correlations between biomarker measurements (FBG and lipid profile), and crude and energy-adjusted FFQ estimates.

> **FFQ is low-cost, easy to administer, and has minimal participant burden. Validation of FFQ is needed to generate valid dietary information towards more reliable diet-disease associations.**

Correlation coefficients are indicators of the strength of the linear relationship between two different variables. The estimates from the 24-hour food recall and the FFQ indicated significant correlation particularly for rice and rice products (r=0.425), and corn and corn products (r=0.401). Meanwhile, a weak association was noted for bread and bakery products, meat and poultry, and sugars and sweets.

For the FFQ-derived estimates and clinical biomarkers, low correlation coefficients were observed in this study, which means a weak relationship between the two variables being compared was evident. Hence, it is recommended to validate cross-classification into quintiles between FFQ-derived estimates and biomarkers to determine the ability of the FFQ to correctly classify participants with high or low levels of biomarkers or to illustrate agreement between the FFQ-estimated intakes and clinical biomarkers. ■

How Prevalent is Anemia among Filipino Households? An Assessment of the Hemoglobin Level of All Household Members based on the 2018-2019 ENNS

Glenda P. Azaña, Ma. Lynell V. Maniego, Jomaica Yvonne R. De Joya,
Ma. Lilibeth P. Dasco, and Charmaine A. Duante

Globally, it was estimated that 39.8% of children 6-59 months old and 29.9% of women 15-49 years old suffered from anemia in 2019 (2021 WHO Global Anemia Estimate). The 2018-2019 Expanded National Nutrition Survey (ENNS) conducted by DOST-FNRI revealed that anemia prevalence in the Philippines was of "mild" public health significance where one in every 10 Filipinos was anemic (10.4%). However, by age and physiologic group, anemia among young children (13.4%), pregnant women (23.0%), lactating women (13.0%), and older persons (18.6%) were higher than the national estimate.

Anemia is a condition when the hemoglobin concentration is lower than normal based on the criteria set by the World Health Organization (WHO, 1972). When there is anemia or when the body lacks healthy red blood cells to carry oxygen to the different tissues (WHO, 2023), an individual may experience symptoms such as fatigue, weakness, dizziness, and shortness of breath which may have an implication on the school performance of children and work productivity of adults, as well as the overall quality of life.

Currently, there is no data on how many members are anemic in one household or if "household anemia" is common in the Philippines. This study determined the prevalence of two or more cases of anemia in Filipino households and the factors contributing to its occurrence. A total of 18,938 households from the 2018-2019 ENNS data were included in the analysis.

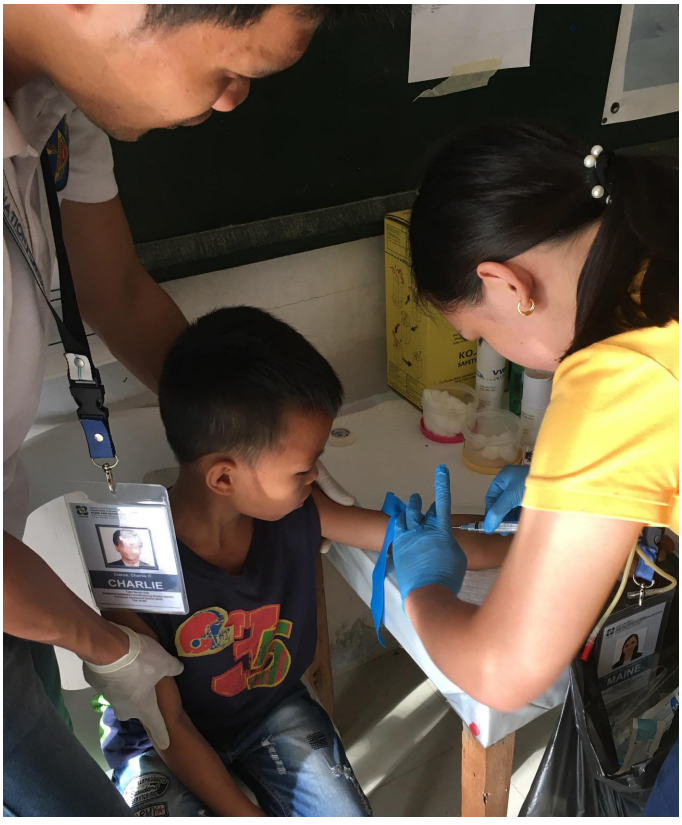
> **Filipino households with more than five members are more likely to have multiple cases of anemia and the risk is even higher in the households with undernourished members.**

Results showed that more than half of the households were residing in rural areas (60.2%), had five or less members (73.7%), and were headed by males (81.8%). Undernutrition was prevalent among young children while overweight and obesity were common among adults and older persons. More than half of the households were not meeting the Recommended Energy Intake (REI) as well as the Estimated Average Requirement (EAR) for most nutrients such as iron, calcium, vitamin A, vitamin C, thiamin, and riboflavin. This indicates that household members had inadequate energy and nutrient intake.

Most households had no anemic member (70.9%), 21.5% had at least one anemic member, and only 7.6% had two or more cases of anemia in the household. The risk of having two or more anemic members was higher in the households with the following characteristics: had more than five members; with 0-23 months old children; with 0-5-year-old children; with 6-10-year-old children; with adolescents; with chronic energy deficient adult; with older persons; with a lactating member; and with the nutritionally at-risk pregnant member. Meanwhile, households that meet the EAR for protein were less likely to have two or more anemic members.

The study provided evidence of the limited information on the existence of two or more cases of anemia in one household in the Philippines. Contributory factors identified included household size and household composition, and the odds of having multiple anemia cases were even higher in the households with undernourished members.

While it is important to prioritize the vulnerable groups such as young children, pregnant women, and lactating women in the provision of micronutrient supplements, it is also equally important to investigate the characteristics and the composition of the households where these groups belonged to prevent the occurrence of having two or more anemic members. ■



Before and After the COVID-19 Pandemic: Assessment of Selected Risk Factors of Non-Communicable Diseases (NCDs) among School-age Children, Adolescents, and Adults in the Philippines

Chona F. Patalen, Charmaine A. Duante, Ma. Lilibeth P. Dasco, Ma. Lynell V. Maniego, Glen Melvin P. Gironella, Apple Joy D. Ducay, Cheder D. Sumangue, Marvin C. Delos Santos, Rod Paulo B. Lorenzo, Antoniette G. Cristobal, and Imelda Angeles-Agdeppa, Ph.D.

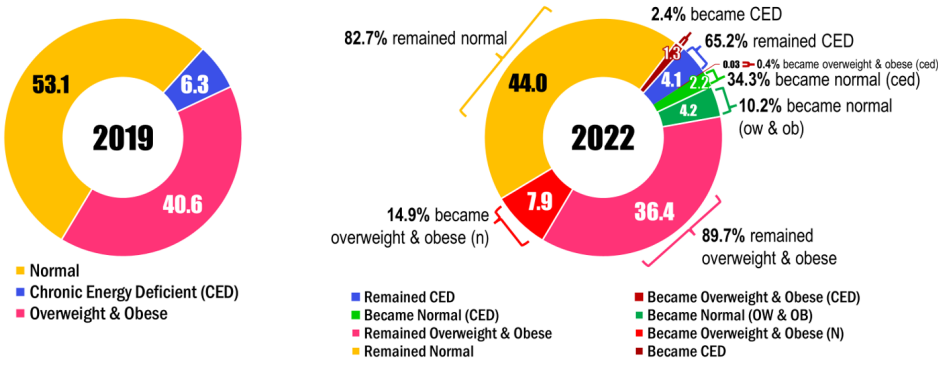
Non-communicable diseases (NCDs) accounted for nearly 70% of all deaths in the Philippines in 2016. These diseases are linked to behavioral risk factors such as tobacco use, excessive alcohol consumption, physical inactivity, and unhealthy diets, which contribute to metabolic risk factors like elevated blood pressure, high fasting blood glucose, abnormal blood lipids, and obesity. The COVID-19 pandemic has further exacerbated these NCD risks, as prolonged lockdowns and restricted movements reduced access to healthy foods and healthcare services, hindering progress toward the Sustainable Development Goals.

To better understand and address these challenges, the National Nutrition Survey (NNS) has been tracking the prevalence of NCD risk factors since 1993. In 2018, the survey was redesigned as the Expanded National Nutrition Survey (ENNS) to improve data reliability and support policy development. Data was collected in 2018, 2019, and 2021, with a special survey conducted in 2022 to compare the food, nutrition, and health situation of Filipinos before and two years after the declaration of the COVID-19 pandemic.

Among school-age children (5-10 years), the stunting rate improved from 23.9% in 2019 to 18.9% in 2022. However, the rates of wasting and overweight worsened after the lockdown, with wasting increasing from 8.2% in 2019 to 10.4% in 2022 and overweight rising from 9.6% to 16.1% in the same period. Dietary intake was also a concern, as the majority of children failed to meet the recommended energy and protein requirements, though there was a slight improvement in 2022.

For adolescents (10 years and one month - 19 years), the prevalence of wasting increased from 11.4% in 2019 to 13.8% in 2022, while overweight and obesity was the same. Risky health behaviors, such as smoking and alcohol drinking, increased significantly during the pandemic. Smoking rates rose from 1.6% in 2019 to 4.2% in 2022, and alcohol drinking rates jumped from 10.1% to 26.7%. Meanwhile, insufficient physical activity significantly improved from 83.5% in 2019 to 74.5% in 2022. In terms of dietary intake, inadequate energy and protein intake also worsened during this period.

Nutritional status of adults, 20 to 59 years old‡, using WHO BMI Classification in selected areas in 2019 and 2022



n=19,512

‡Age of adults based on 2019 Survey

> **Over the years, the prevalence of NCD risk factors generally increased despite some improvements, making millions of Filipinos vulnerable to developing NCDs. An intensive response by the government and private institutions is warranted to mitigate the unyielding prevalence of NCDs.**

Adults (20-59 years) experienced an increase in overweight and obesity rates from 40.6% in 2019 to 44.4% in 2022. While smoking rates slightly declined, alcohol consumption and insufficient physical activity increased. Dietary intake continued to be a problem, with the majority of adults failing to meet the recommended energy and protein requirements, and these rates worsened in 2022.

Among older persons (60 years old and above), chronic energy deficiency (CED) slightly increased from 13.1% in 2019 to 14.4% in 2022. Overweight and obesity rates remained relatively the same between 2019 and 2022. However, the percentage of insufficiently physically active rose significantly from 40.8% in 2019 to 50.8% in 2022, likely due to the restrictive policies implemented during the pandemic. Inadequate energy and protein intake was also a major issue, with rates increasing significantly in 2022.

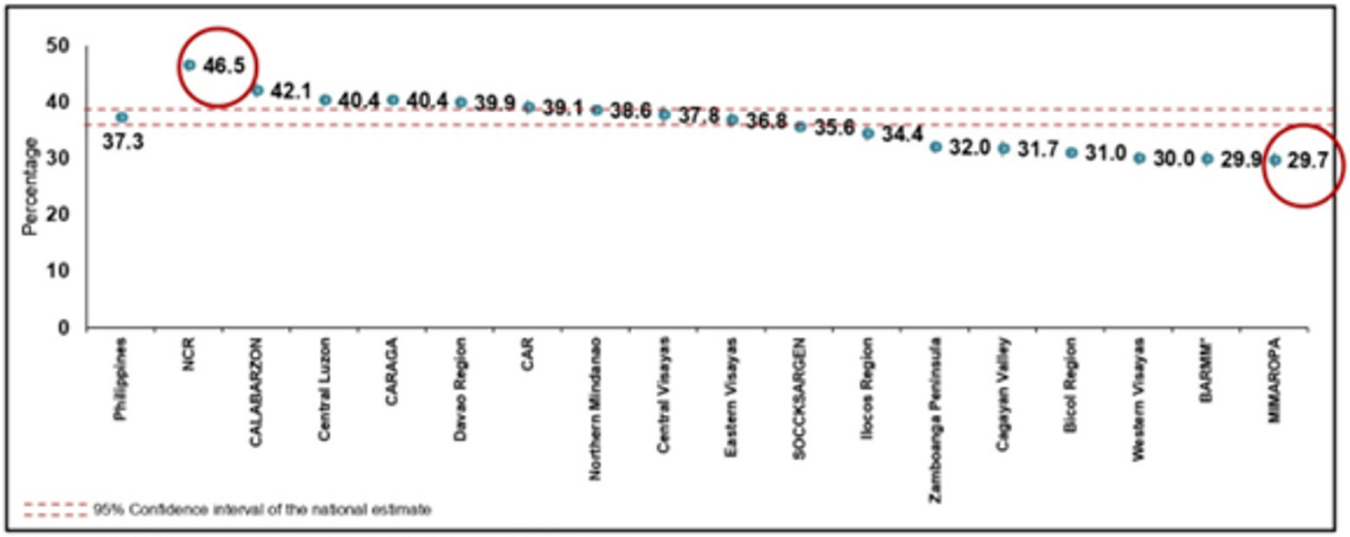
To track the country's progress in various national and global commitments, such as the Philippine Development Plan 2023-2028, particularly sub-chapters 2.1 on Boost Health and 3.1 on Ensure Food Security and Proper Nutrition, and the SDGs, particularly SDG 2 on Zero Hunger and SDG 3 on Good Health and Well-Being, regional estimates on selected food and nutrition indicators were generated based on the 2018, 2019, and 2021 ENNS.

Regional estimates revealed that the highest rates of overweight and obesity were observed in the National Capital Region (NCR) across all age groups. These regional estimates provide valuable data for addressing food, nutrition, and health challenges in different parts of the country.

Over the years, despite some improvements, the prevalence of NCD risk factors has generally increased, making millions of Filipinos vulnerable to these diseases.

This persistent prevalence of NCD risk factors underscores the need for an intensive response from the government, private institutions, and other stakeholders. Systematic, evidence-based programs and proper monitoring and evaluation are essential for meeting national and global health commitments. Addressing these challenges effectively will improve the

Prevalence of overweight/obesity among adults (20 years old and above) by region: ENNS 2018, 2019, & 2021



*Sulu was not included in the computation; not covered due to peace and order situation during the time of data collection in 2019.

Eating Practices and Nutritional Adequacy of Selected School Children in Muntinlupa City

Rowena V. Viajar, Emily O. Rongavilla, Joanne Jette S. Gulay,
Glen Melvin P. Gironella, and Nicole R. Gumapac

In the Philippines, undernutrition among school-age children (SC) 5-10 years old is still prevalent as shown in the 2021 Expanded National Nutrition Survey (ENNS) conducted by the DOST-FNRI. Likewise, the mean daily energy and micronutrient intakes among SC were found inadequate (DOST-FNRI, 2022).

The ENNS survey revealed a high prevalence of undernutrition among SC in Muntinlupa City. Thus, the study determined the characteristics, eating practices, and dietary intake of selected undernourished public SC in Muntinlupa City. A total of 100 screened undernourished SC 6-9 years old were selected as study participants. Data on household, parent or guardian, and child characteristics, as well as the child's dietary intake, were collected using a two non-consecutive day 24-hour food recall, with parents or guardians as respondents.

The findings of the study showed that a big majority of the respondents were mothers of the study children (76%), reached at least high school level (65.7%), and with a mean age of 38 years. Nearly half (49.5%) of the household heads worked in elementary occupations, 52.5% of the households have 0-5 years old children, and with a mean household size of seven (7). More than half of the study children were males and second child in the family (32.2%). The eating practice of most of the children at breakfast is biscuit/bread and beverage (24.2%), while the usual lunch is rice and meat, chicken, or fish (21.2%) combination. Some SC consumed vegetables but in little amount, and only few of them had fruit as part of their diet.

Results also showed that more than half of the children did not meet the recommended energy requirement

and the estimated average requirements (EAR) for iron, calcium, vitamins A and C. Nine year old children have a significantly higher proportion of meeting the recommended energy than younger age children in the study. The likelihood of meeting the recommended EAR for thiamine was significantly higher for those children who are the second child in the family, living in nuclear families, with five or fewer members in the family, with household heads working in service and sales.

> **"Food intake of under nourished schoolchildren was associated with family type, household size, and occupation of the household head, as well as their age and birth order."**

With these findings, interventions to improve household nutrient intake and eating practices of SC toward better nutritional status are vital. Participation in government programs such as family planning, backyard and school gardening, dietary supplementation, and nutrition education among parents/guardians and SC may help address undernutrition among this age group. ■

Association of Individual Dietary Diversity Score and the Nutritional Adequacy of Diet of Filipino Adults

Frances Pola S. Arias and Ma. Lynell V. Maniego

Photo grabbed from Conklin, A. 2016. A varied diet can prevent diabetes – but can you afford it? Communicating Diet and Activity Research. University of Cambridge. Retrieved January 30, 2024 from https://www.cedar.iph.cam.ac.uk/2016/07/20/a-varied-diet-can-prevent-diabetes-but-can-you-afford-it/

A third of the world's population is affected by micronutrient deficiencies, which may directly or indirectly predispose individuals to mortality and morbidity. According to the Food Consumption Survey of the 2018-2019 Expanded National Nutrition Survey (ENNS) of the DOST-FNRI, only 18.4% of adults 19 to 59 years old were able to meet the recommended energy intake. Furthermore, less than a quarter were able to meet the estimated average requirements for essential nutrients such as iron, calcium, vitamin A, vitamin C, thiamin, and riboflavin.

Dietary diversification is one of the most recommended sustainable approaches in alleviating nutritional problems resulting from food insecurity and inadequate intake of micronutrients. Dietary Diversity Scores (DDS) simply consist of simple counts of food groups that a household or an individual has consumed over the preceding 24 hours. In several developing countries, DDS has been used in evaluating micronutrient adequacy and dietary diversity among children and adults.

In this study, the relationship between individual dietary diversity score and nutritional adequacy of the diet of Filipino adults was determined through secondary data analysis of the 2018-2019 ENNS pooled food consumption data of 68,529 adults, 19 to 59 years old. Descriptive and multiple logistic regression analyses were done using Stata version 16.0. Mean and usual intake distributions of energy and nutrients were estimated using the PC-SIDE software, while the Philippine Dietary Reference Intakes (PDRI) 2015 was used as the basis to compute for nutrient adequacy.

Findings of the study showed that 28.4% and 9.0% of Filipino adults are overweight and obese, respectively. Moreover, majority of female adults have a high Waist-to-

> **DDS should only be used as a supplementary and not as a substitute for other quantitative dietary assessment tool.**

were positively correlated with the DDS.

The positive correlation between DDS and MAR suggests that DDS can reflect individual dietary quality. Looking closely into DDS, dietary patterns of population groups can be understood. Since a higher DDS connotes a higher micronutrient intake, a decrease or increase reflects the diet of the individual.

Hip ratio (60.3%), indicating a higher risk of developing non-communicable diseases. The average mean adequacy ratio (MAR) of all respondents is 0.60, with niacin, protein, and energy having the highest nutrient adequacy ratios (NARs), while Vitamin C has the lowest. The mean total DDS of Filipino adults is 4.36, with starchy staples (1.00), and organ meats (0.07) having the highest and lowest mean DDS, respectively. MAR and NAR of all nutrients

In essence, DDS provides a holistic view of an individual's nutrient consumption and thereby may serve as a valuable tool in assessing and monitoring overall nutrient intake. However, it is worth noting that DDS should only be used as a supplementary and not as a substitute for other quantitative dietary assessment tool. It may be used as a screening tool in identifying individuals who would need more thorough evaluation. ■

Table 1. Pearson correlation coefficients between nutrient adequacy ratio of nutrients and dietary diversity scores of adults 19-59 years old by sex: Philippines, 2018-2019 (n=64,263)

	Dietary Diversity Scores						p-value
	ALL		MALE		FEMALE		
	Corr	p-value	Corr	p-value	Corr	p-value	
MAR	0.2848	0.0000	0.2944	0.0000	0.3245	0.0000	0.0000
NAR Vitamin A	0.3043	0.0000	0.2860	0.0000	0.3201	0.0000	0.0000
NAR Vitamin C	0.2171	0.0000	0.2025	0.0000	0.2230	0.0000	0.0000
NAR Thiamin	0.2037	0.0000	0.2117	0.0000	0.2222	0.0000	0.0000
NAR Riboflavin	0.3261	0.0000	0.3096	0.0000	0.3384	0.0000	0.0000
NAR Niacin	0.0795	0.0000	0.0872	0.0000	0.0948	0.0000	0.0000
NAR Calcium	0.1827	0.0000	0.1683	0.0000	0.2255	0.0000	0.0000
NAR Iron	0.0804	0.0000	0.2300	0.0000	0.2283	0.0000	0.0000
NAR Energy	0.1478	0.0000	0.1447	0.0000	0.1597	0.0000	0.0000
NAR Protein	0.1386	0.0000	0.1397	0.0000	0.1607	0.0000	0.0000

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Assessment of the Nutritional and Health Status of Children and Adults Residing in Geographically Isolated and Disadvantaged Areas (GIDA): ENNS 2018, 2019, & 2021

Charmaine A. Duante, Ma. Lynell V. Maniego, Mary Bernadette M. Velasquez, and Romalyn L. Tordecilla

Photo grabbed from DOST-FNRI Fieldnotes. https://fnri.dost.gov.ph/index.php/programs-and-projects/news-and-announcement/752-field-notes-covering-gidas-geographycally-isolated-and-disadvantaged-areas

The Department of Health (DOH) characterizes Geographically Isolated and Disadvantaged Areas (GIDAs) as communities that are marginalized due to physical and socio-economic barriers separating them from mainstream society. As of 2022, the Philippines has classified 6,463 barangays as GIDA, indicating a growing population that is vulnerable to health inequities in the country. This predisposition causes GIDAs to have weak healthcare systems and lack the capacity to conduct comprehensive nutrition and health assessments.

The study assessed the nutritional and health status of children 6-59 months and adults 20-59 years residing in GIDA using the data collected from the 2018, 2019, and 2021 Expanded National Nutrition Survey (ENNS) by the DOST-FNRI. Various socio-economic, demographic, anthropometric, biomarker, and clinical predictor variables were considered in the logistic regression analyses to assess nutritional status (NS).

The results of the study showed that 44.0% of households in GIDA were poor and 62.9% had more than five members. Underweight (25.6%) and stunting (41.9%) were considered high and very high public health concerns, respectively, while wasting was a poor public health concern at 5.9%. Anemia was a mild public health problem affecting 15.8% of children. Furthermore, two in ten children had low serum vitamin A levels, indicating severe public health significance. Significantly high percentages of underweight, stunting, and vitamin A deficiency were noted in GIDA.

On the other hand, among adults, 14.0% finished their college education and 81.2%

were living in rural areas. Chronic energy deficiency (CED) in GIDA was of low public health significance at 8.8%, while overweight/obesity prevalence was at 29.0%. Anemia affected 8.4% of adults, and 14.2% had elevated blood pressure, which increased with age.

> **The study revealed the triple burden threat of malnutrition in the form of undernutrition, overnutrition, and micronutrient deficiencies in geographically disadvantaged areas in the Philippines that are present among children and adults.**

Regression analyses showed that children aged 6-23 months were less likely to become underweight and stunted but more likely to become wasted than older children aged 24-59 months. Wasting during early childhood could potentially impact child development, as the growing child's increased demand for energy and nutrients may not be met. This unmet need leaves the child continually susceptible to nutritional deficiencies, thereby limiting their potential for weight and height gain. Anemia was only associated with underweight while the presence of Vitamin A Deficiency (VAD) increased the likelihood of being underweight and stunted. Children from households with poor wealth status were more likely to be underweight and wasted. Moreover, children in food-insecure households were twice more likely to be stunted than their counterparts. The combination of food insecurity and poor wealth status affects food accessibility which may then lead to decreased food intake, resulting in lower weight and height.

Among adults, older age, higher educational attainment, and the presence of hypertension were protective against CED but were predictors of overweight/obesity. On the other hand, food insecurity and current smoking status increased the likelihood of CED but lowered the likelihood of overweight/obesity. As expected, having poor wealth status also decreased the odds of overweight/obesity because low socioeconomic status restricts excessive food consumption. Urban residence, insufficient physical activity (PA), and being female increased the odds of overweight/obese.

The study highlighted the triple burden of malnutrition in the form of undernutrition, overnutrition, and micronutrient deficiencies in GIDA among children and adults. It emphasized the growing concern for non-communicable diseases (NCDs) like hypertension and insufficient physical activities, indicating the need for comprehensive policies and programs to address these multifaceted challenges especially in disadvantaged areas. ■

Photo grabbed from Philippine Center for Investigative Journalism, August 26, 2021. https://pcij.org/article/6827/isolated-philippine-communities-are-safe-from-coronavirus-but-not-from-hunger

Urban and Rural Prevalence and Determinants of Anemia among School-Aged Children in the Philippines: Evidence from the 2018-2019 Expanded National Nutrition Survey

Kim Irvin T. Protacio, Jomaica Yvonne R. de Joya, and Cheder D. Sumangue

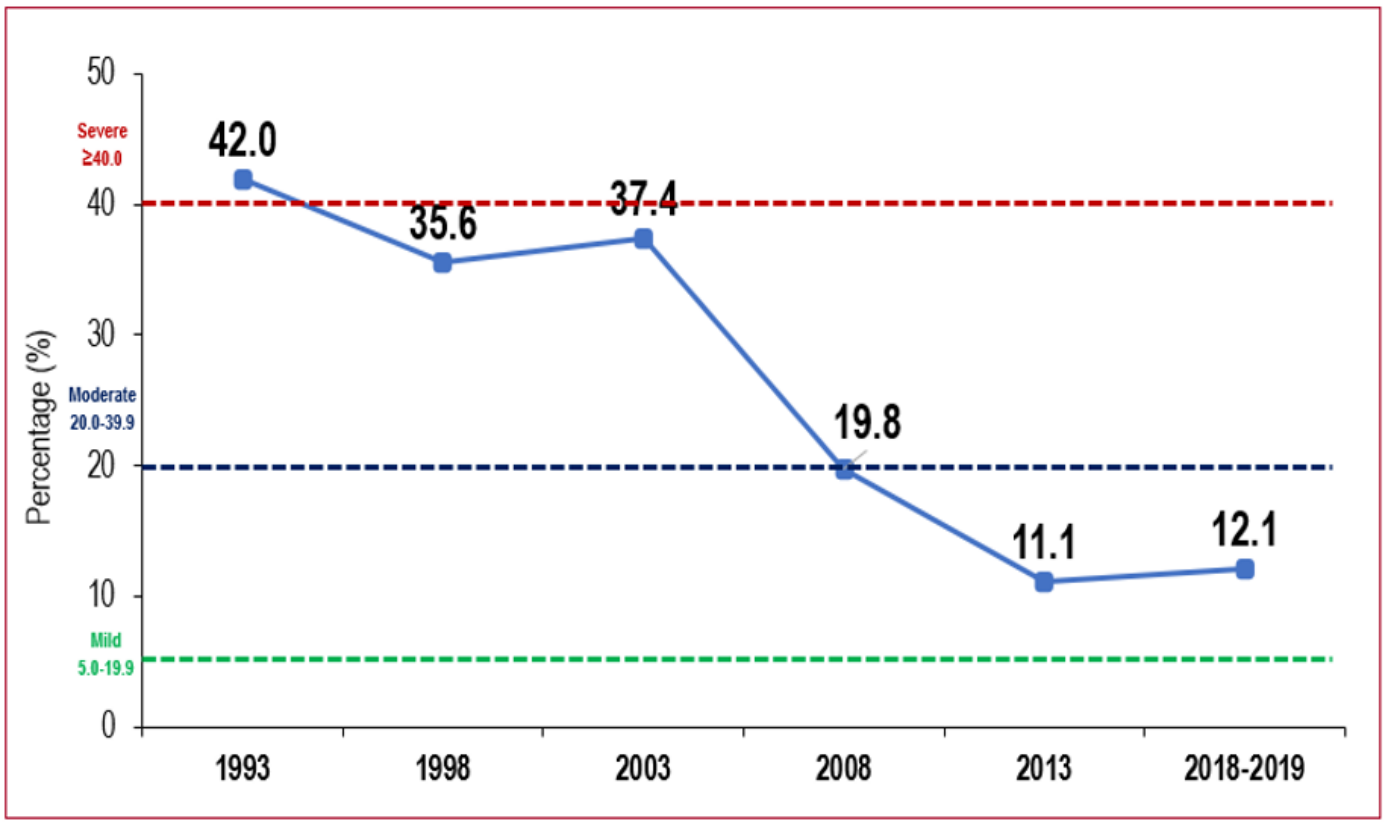
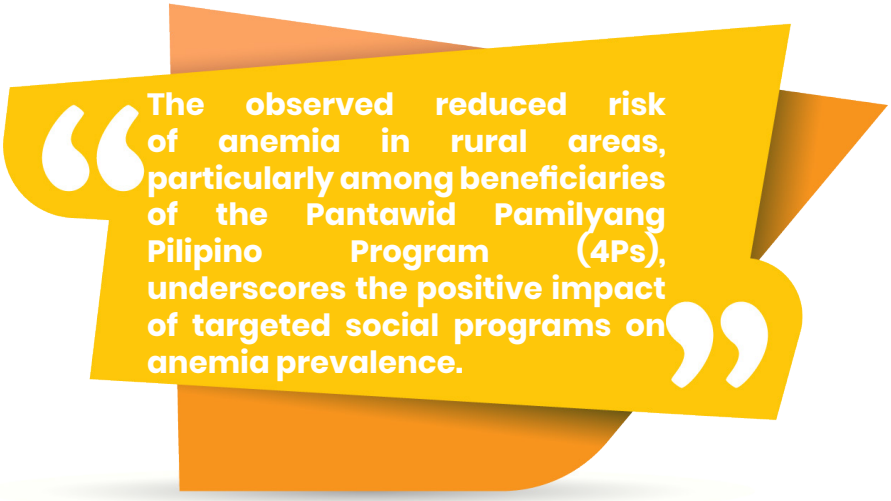


Figure 1. Trends in the prevalence of anemia among school-age children (6.0-12.0 yrs. old): Philippines 1993-2018

Anemia, characterized by hemoglobin deficiency, is a pervasive global public health challenge, exerting a significant impact on school-age children, especially in vulnerable urban and rural settings. The Philippines, as an archipelagic nation in Southeast Asia, is not immune to this concern. This study endeavors to comprehensively investigate the prevalence and determinants of anemia in the country, considering both urban and rural contexts.

The temporal analysis, spanning from 1993 to 2019, as depicted in Figure 1, unveils a noteworthy declining trend in anemia prevalence among Philippine school-age children. However, this trajectory took a subtle turn in 2018-2019, with 12.1% of children affected, categorizing it as a "mild" public health risk according to WHO criteria (WHO, 2001). This nuanced trend underscores the dynamic nature of anemia prevalence among the youth, highlighting the necessity for a targeted and adaptable public health approach.

Understanding the multifaceted challenges posed by anemia demands a comprehensive examination of diverse factors influencing its prevalence in different settings. The interplay of socio-



economic conditions, nutritional patterns, access to healthcare, and environmental factors can vary significantly between urban and rural contexts. Thus, it becomes essential to adopt a holistic perspective that acknowledges the complexities of these factors when designing effective interventions..

A secondary analysis of the data collected in the 2018-2019 Expanded National Nutrition Survey (ENNS) was conducted. The study population included 9289 Filipino school-aged children from sampled households, with only those meeting specific criteria being included. The analysis revealed substantial socio-demographic variations in both individual and household characteristics among school-aged children in the Philippines, emphasizing nuanced distinctions between urban and rural contexts.

The national prevalence of anemia in the Philippines, standing at 13.7%, signals a state of "mild significance" as a public health concern. This statistic serves as a pivotal indicator, reflecting the extent of the challenge that anemia poses to the overall health landscape of the country. This issue among school-aged children is linked to various factors, revealing a complex landscape of anemia prevalence. The identified age-related discrepancy emphasizes the critical role of age, with children aged 6-9 facing an elevated risk compared to their 10-12-year-old counterparts, potentially due to factors such as growth-related iron requirements. Conversely, the protective effect of being overweight or obese highlights the intricate relationship between nutritional status and anemia risk mitigation, emphasizing the importance of a well-balanced diet.

The observed reduced risk of anemia in rural areas, particularly among beneficiaries of the Pantawid Pamilyang Pilipino Program (4Ps), underscores the positive impact of targeted social programs on anemia prevalence. The 4Ps program, focusing on nutrition, health check-ups, and education, contributes to a lower likelihood of anemia among the supported demographic in rural settings. In urban areas, the efficacy of the National Dietary Supplementation program further accentuates the importance of tailored interventions. Enrolled children in urban settings exhibit a notably lower likelihood of anemia, suggesting that dietary supplementation plays a pivotal role in addressing anemia in these contexts. Overall, these findings underscore the intricate interplay of age, nutritional status, and the influence of targeted programs in shaping the multifaceted landscape of anemia prevalence among school-aged children in the Philippines. ■

Technology and Knowledge Diffusion Program

IP Management Program for Academic Institutions Commercializing Technologies (IMPACT): "Enhancement of the DOST-FNRI's Technology Transfer Office Policies and Processes"

Alexis M. Ortiz, Milflor S. Gonzales, Ph.D., Jaypy S. De Juan, Lea B. Landicho, Ulpiano A. Florida, Nichole M. Bristol, John Albert F. Malaki, Ricamae V. Larrazabal, Samuel Joseph Pitel, and Jhun Navacilla

In 2021, the Department of Science and Technology – Food and Nutrition Research Institute (DOST-FNRI) implemented the Intellectual Property Management Program for Academic Institutions Commercializing Technologies (IMPACT): "Enhancement of the DOST-FNRI's Technology Transfer Office Policies and Processes". The project is through the funding support of DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD). It enhanced the technology transfer office policies and process being implemented by the Institute. The project is aligned with the DOST's Agenda No. 6, which pertains to maximized utilization of R&D results through technology transfer and commercialization. This is likewise aligned to the 2020-2024 DOST-FNRI Institutional Strategic Plan.

The project activities included consultation, benchmarking and collaboration with other government agencies and industries to:

a. Institutionalize the technology assessment of the commercializable technologies like Iron-Fortified Rice(IFR) and Multi-Nutrient Growth Mix (MGM); and

b. Identify and collaborate with at least two (2) state universities and colleges (SUCs) clients of DOST-FNRI in establishing their Technology Transfer and Business Development Offices (TTBDOs)

The following are the project accomplishments:

- Amended the DOST-FNRI's guidelines on technology transfer

- Conducted benchmarking activity with University of the Philippines Technology Transfer Business Development Office (UP-TTBDO), which provided the DOST-FNRI copies of their forms, particularly for Intellectual Property (IP) applications that were used as reference for conceptualizing the FNRI Intellectual Property System.

- Conducted brainstorming/meeting with the DOST-FNRI R&D group on the latest technologies to be launched in 2022

- Collaborated with Central Bicol State University of Agriculture (CBSUA) and Davao del Norte State College (DNSC) in establishing their TTBDOs and signed Memoranda of Agreement with CBSUA and DNSC

- Conducted an on-site technical assistance for CBSUA and DNSC through a learning-workshop as part of the Memorandum of Agreement with both parties

- Conducted capability-building webinars on the "Development of Technology Transfer Plan" and "The Art of Business Pitching + Business Development" for other IMPACT grantees and beneficiaries/ partners

- Institutionalized the technology assessment of the commercializable technologies

- Commercialized the DOST-FNRI-developed Iron-Fortified Rice and Multi-Nutrient Growth Mix, and accomplished two (2) signed Technology Licensing Agreements.

With the overall accomplishments of the project, the IMPACT program contributed to the technology transfer efforts of DOST-FNRI as it continues to pursue new opportunities to bring the different technologies to intended beneficiaries even in the far-flung areas of the country. ■

Training-Workshop on the Technology Needs Assessment (TNA) Protocol for the Department of Science and Technology (DOST) Personnel

Jaypy S. De Juan, Lea B. Landicho, Janel Anne C. Eder, Filipiniana B. Bragas, Alexis M. Ortiz, and Milflor S. Gonzales, Ph.D.

A total of 47 personnel from different DOST attached agencies, sectoral planning councils, research and development institutes, and regional offices attended the DOST-HRDP funded project "Training-Workshop on the TNA Protocol for the DOST Personnel" on March 21-24, 2023 at Hortz Hotels and Resorts, Tagaytay City.

The said 4-day training-workshop was designed for new DOST staff to be familiar and knowledgeable on the protocol of technology assessment, have a common understanding on the TNA protocol and apply it in their areas of responsibility, and identify and provide the most appropriate technological intervention for their beneficiaries.

The training-workshop comprised of lectures, open forum, site visits, and report preparations and presentations. The lectures covered the TNA major components, steps, core business functions, forms to be used, and an assessment plan.

The TNA is an activity wherein the DOST Regional and Provincial Offices conduct face-to-face interview to know the client and its business background, and to assess the facility and existing equipment of the micro-small-and-medium enterprises (MSMEs). Also, through this assessment, the DOST Regional and Provincial offices provide assistance through consultancy services to improve their products,

services, facilities, among others. The result of the TNA is used for the DOST Small Enterprise Technology Upgrading Program (SET-UP), a program that enables firms to address their technical problems through technology transfer and technological interventions to improve productivity, better product quality, human resources development, cost minimization, waste management, and other operation-related activities.

DOST-FNRI former Director, Dr. Mario V. Capanzana, served as the resource speaker of the training.

At the end of the training, the participants were able to produce five (5) PowerPoint presentations of group outputs, five (5) TNA reports from the facilities, and five (5) signed and notarized Non-Disclosure forms. ■

> **"The TNA is an activity wherein the DOST Regional and Provincial Offices conduct face-to-face interview to know the client and its business background, and to assess the facility and existing equipment of the micro, small, and medium enterprises (MSMEs)."**

DOST-FNRI Conducts DOST-wide Training on Pandemic-Proof Projects (3Ps) Learnings

Idelia G. Glorioso, Dexter Y. De Leon, Shannen Faye Q. Arevalo, Erika Niña C. Bacolod, Christelle Lois T. Bayalas, John Mark M. Villanueva, Ma. Corazon E. Palompo, and Milflor S. Gonzales, Ph.D.

"*Make the most of the opportunities that are available, and more importantly, let us invest in future-proofing our projects to minimize impacts, and to encourage innovation and technological adaptation.*" This was one of the take away messages from DOST Secretary Renato U. Solidum, Jr.'s inspirational message during the two-and-a-half-day Training on Pandemic-Proof Projects (3Ps) Learnings on April 18-20, 2023 at the Eurotel Makati Hotel.

Funded and supported by the DOST-Human Resource Development Program (DOST HRDP), the DOST-FNRI initiated the event to capacitate and build more flexibility among DOST employees during their project implementations in the now normal. The Institute believes that by recognizing the challenges encountered and learnings from the past projects implemented during the pandemic, this can make future project implementation more resilient and pandemic-proof, hence, yielding better results.

On the first day of the training, Dr. Imelda Angeles-Agdeppa, Director IV and Scientist IV, warmly welcomed the 55 participants from different DOST regional offices and attached agencies who attended the training. Aside from Secretary Solidum's inspirational message which was through a recorded video, USec. Sancho A. Mabborang, DOST Undersecretary for Regional Operations, also gave his message of encouragement in the same format. On the other hand, USec. Leah

Buendia, DOST Undersecretary for Research and Development, graced the said event by giving her message for support in person.

On the same day, Professor Mayo Grace C. Amit, Assistant Professor V of University of the Philippines – Los Baños, presented topics on project planning and the development agenda, project development for impact results-based management and evaluation, and sustainability strategies in project management. This was followed by the presentation of mechanics for the first workshop.

> **"The Institute believes that by recognizing the challenges encountered and learnings from the past projects implemented during the pandemic, can make future project implementations more resilient and pandemic-proof, hence, yielding better results."**

The participants presented their outputs on the second day which were critiqued by Professor Amit as well. The participants were divided into 6, composed of 6-8 members. Topics presented focused on project implementation, monitoring and evaluation, planning, and sustainability. Through sharing of experiences and strategies, these learnings can make the participants' future project proposals more resilient. In the afternoon session, Mr. Nicolai "Nico" V. Reyes, Vice President of Rebel Marketing, presented the topic "Applying Marketing Principles to Promote Popularization and Commercialization of DOST's Projects and Researches" wherein he gave tips and suggestions on trends, marketing hacks, and pitch hacks or decks to enhance project promotion efforts.

The last day of the training was the day of preparation and presentation for Workshop 2 wherein the participants developed a message house for an existing DOST project and created a pitch deck that will be presented to a potential partner. Each group chose a representative to present their outputs, which showed how productive and creative they were.

Indeed, this is only the beginning of efforts to make DOST more relevant to everyone. The DOST-FNRI will continue to deliver quality trainings to make our future projects more pandemic proof as we are #OneDOST4U. ■

DOST Communication, Information Officers Trained on Audience Research and Storytelling in Science Communication

Salvador R. Serrano, Nichole M. Bristol, Franzis Jayke Batallantes, and Milflor S. Gonzales, Ph.D.

About 60 communication and information officers from DOST agencies and regional offices attended the DOST-HRDP funded project "Training on Disseminating Science and Technology Information through Science Communication Approaches" on May 16 - 18, 2023 at the Manila Grand Opera Hotel, Manila City.

The said three-day training is designed to train information officers and communication specialists of DOST agencies and regional offices on fundamentals of audience research in science communication and audience-centered science storytelling focused on countering false S&T news and information.

Science communication provides effective and audience-specific approaches to make scientific information accessible, understandable, and useful among audiences. It aims to make audiences understand and utilize relevant scientific solutions to various societal concerns such as food and nutrition problems.

The DOST recognizes the heterogeneity of audiences when cascading S&T information. The identity and characteristics of S&T audiences are diverse, such that different communication approaches (messaging, platforms, etc.) are needed to influence and persuade a specific audience segment or profile effectively.

> **The three-day training is designed to train information officers and communication specialists of DOST agencies and regional offices on fundamentals of audience research in science communication and audience-centered science storytelling focused on countering false S&T news and information.**

The training covered principles of audience research for science-related commmunication programs and activities, audience research methods, types of audience segmentation and audience targeting, and principles and techniques of effective science storytelling.

Mr. Garry Montemayor, University of the Philippines Los Baños Assistant Professor IV, and Mr. Nico V. Reyes, Rebel Marketing Managing Partner and Vice President, served as the resource speakers in the training.

At the end of the training, the participants produced two outputs: one individual audience segmentation matrix that will fit the audiences of their own respective science communication activities and one group social media content plan which aims to counter and address science fake news. ■

DOST-FNRI Conducts Training on Pretesting of Information, Education and Communication (IEC) Materials

Idelia G. Glorioso, Dexter Y. De Leon, Shannen Faye Q. Arevalo, Erika Niña C. Bacolod, Christelle Lois T. Bayalas, John Mark M. Villanueva, Ma. Corazon E. Palompo, and Milflor S. Gonzales, Ph.D.

Information, Education, and Communication (IEC) materials are resources and tools developed for advocacy, behavior change, and knowledge dissemination. This is according to Asst. Prof. Luisa A. Gelisan, Faculty of Information and Communication Studies from the University of the Philippines Open University in her lecture during the Training on Pretesting of IEC Materials on August 2-4, 2023 at the Selah Pods Hotel, Pasay City.

Pretesting, on the other hand, is the process of bringing together members of the priority audience to react to the components of IEC material before they are produced in final form, as defined by Mr. Bernabe M. Remoquillo, Graphic Artist and Multimedia Production Specialist, also a resource speaker of the training.

The Training on Pretesting of IEC Materials is the last among the four capacity-building trainings conducted by the DOST-FNRI in 2023 that were funded and supported by the DOST Human Resource Development Program (DOST HRDP) for DOST personnel representing attached agencies and the regional and provincial offices. This initiative provides learning and development opportunities to upgrade the competencies of the information officers and communication specialists of the DOST system on developing and pre-testing IEC materials among intended audiences.

Dr. Imelda Angeles-Agdeppa, DOST-FNRI Director IV and Scientist IV, warmly welcomed the 43 participants of the training. DOST Secretary Renato U. Solidum, Jr. via video recording gave an Inspirational Message where he mentioned that the true impact lies on how one integrates what was learned into daily life and work. Dr. Leah J. Buendia, DOST Undersecretary for Research and Development and USec. Maridon O. Sahagun, DOST Undersecretary for Scientific and Technical Services also delivered Messages of Support through video recordings.

> **"This initiative provides learning and development opportunities to upgrade the competencies of the information officers and communication specialists of the DOST system on developing and pre-testing IEC materials among intended audiences."**

Topics presented by the resource speakers on the first day included the Introduction to IEC Materials, the Front-End Analysis (FEA), Developing a Creative Brief, Elements and Principles of Graphic Design, and Mayer's principles of Multimedia Learning.

On the second day, IEC Production Process and Pretesting were discussed. Participants were grouped for the first workshop to craft pre-testing questionnaires based on the IEC materials given to them.

On the last day of the two-and-a-half day training, participants conducted a mock Focus Group Discussion (FGD) as part of Workshop 2. Each group presented the highlights of the mock FGDs.

In his Closing Remarks, DOST Undersecretary for Regional Operations, USec. Sancho A. Mabborang thanked the participants and resource speakers and commended the DOST-FNRI for spearheading the DOST-HRDP training and extending it to the DOST Regional Offices and attached agencies. He also shared a quote from Anne Roe: "Nothing in science has any value to society if it is not communicated". *"One of our reasons why we conduct researches is to make lives better for everyone. That is why it is not right if we have a lot of researches, but we do not share them"*, USec. Mabborang added.

The DOST-FNRI, with the support from DOST-HRDP, will continue to provide trainings to equip DOST employees in effectively and efficiently communicating various research results among their intended audiences, all for the goal of #OneDOST4U. ■

Outcome 2

Technology Adoption Promoted and Accelerated

TRANSFERRED TECHNOLOGIES AND SERVICES TO ADOPTORS

177 Licensing Agreements Signed

2023 LICENSING AGREEMENTS

Technology	Name	Date Signed
Complementary Foods (25)		
Coco Bisc	Nutridense Food Manufacturing Corporation	January 20, 2023
	Aretei Foods Corporation	January 20, 2023
	Allycel General Merchandise	August 30, 2023
	JBM Food Products	August 30, 2023
Coco Blend	Nutridense Food Manufacturing Corporation	January 20, 2023
	Aretei Foods Corporation	January 20, 2023
	Allycel General Merchandise	August 30, 2023
	JBM Food Products	August 30, 2023
Coco Puff	Nutridense Food Manufacturing Corporation	January 20, 2023
	Aretei Foods Corporation	January 20, 2023
	Allycel General Merchandise	August 30, 2023
	JBM Food Products	August 30, 2023
Enteral Food Formula	Swisspharma Research Laboratories, Inc.	January 20, 2023
Micronutrient Growth Mix (MGM-6)	Swisspharma Research Laboratories, Inc.	January 20, 2023
Micronutrient Growth Mix (MGM-9)	Swisspharma Research Laboratories, Inc.	January 20, 2023
Micronutrient Growth Mix (MGM-14)	Swisspharma Research Laboratories, Inc.	January 20, 2023
Micronutrient Growth Mix for Pregnant and Lactating Women	Swisspharma Research Laboratories, Inc.	January 20, 2023
Rice Mongo Curls	Allycel General Merchandise	April 18, 2023
	JBM Food Products	May 31, 2023
	Provincial Government Of Quezon-Quezon Food & Herbal Processing Center	August 30, 2023

Technology	Name	Date Signed
Rice Mongo Instant Blend	Aretei Foods Corporation	January 20, 2023
	Allycel General Merchandise	April 18, 2023
	JBM Food Products	May 31, 2023
	Provincial Government Of Quezon-Quezon Food & Herbal Processing Center	August 30, 2023
Rice Mongo Sesame Blend	JBM Food Products	May 31, 2023
Fortified Foods (17)		
Tubig Talino	Fresh Q Enterprises Corporation	January 20, 2023
	Aqua Dabaw Water Refilling Station	January 20, 2023
	Bilibinwang Multi-Purpose Cooperative	January 20, 2023
	Bst M Water Refilling Station	January 20, 2023
	Riverside Multi-Purpose Cooperative	April 18, 2023
	The Riverside Multi-Purpose Cooperative	August 30, 2023
Iron Fortified Rice	RC Violago Rice and Palay Dealer	January 20, 2023
	Enmiri Corporation	April 18, 2023
	CM & Sons Food Products, Inc.	April 18, 2023
	D' Paragon AA Corporation	June 26, 2023
	Greatfoods Concepts, Inc.	July 28, 2023
	D' Paragon AA Corp	August 30, 2023
	Palangue Agrarian Reform Cooperative	September 13, 2023
	Cervantes Rice Traders Association Incorporated	September 13, 2023
Iron Rice Premix	CM & Sons Food Products, Inc.	April 18, 2023
	Greatfoods Concepts, Inc.	July 28, 2023
	Allycel General Merchandise	August 30, 2023
Enhanced Nutribun (135)		
Squash Puree	Sentrong Pamilihan Ng Produktong Agrikultura Sa Quezon Foundation, Inc (SPPAQFI)	May 31, 2023
Enhanced Nutribun Squash Variant	Bantog Samahang Nayon Multi-Purpose Cooperative	February 21, 2023
	Eastern Primary Multi-Purpose Cooperative	February 21, 2023

Technology	Name	Date Signed
Enhanced Nutribun Squash Variant	Jainin's Cakes 7 Pastries	February 21, 2023
	Regino's Bakeshop	February 21, 2023
	101 Bakeshop	February 21, 2023
	Philippine Nutri-Foods Corporation (PNFC)	February 21, 2023
	GMC Bakery	February 21, 2023
	United Tingguians Multipurpose Cooperative	February 23, 2023
	Iloilo Supermart. Inc.	February 23, 2023
	Theresa's Bakeshop	February 23, 2023
	Helen's Candy And Pastries	February 23, 2023
	Larena Triad Restaurant, Bakeshop & Catering Services	February 23, 2023
	T.A. Central Metro Foods Inc.,	February 23, 2023
	City College Of Calapan	February 23, 2023
	Saint John Bakeshoppe	February 23, 2023
	Laizan Foods Corp.	February 23, 2023
	City Government Of Bacoor	April 12, 2023
	Efren's Bakery	May 31, 2023
	Evanrodz Consumer Goods Trading	May 31, 2023
	Panny's Homebake Products, Inc.,	May 31, 2023
	Balanga Agrarian Reform Beneficiaries Multipurpose Cooperative (BARBMPC)	May 31, 2023
	Calinog Farmers Agriculture Cooperative (CAF-Agri-Coop)	May 31, 2023
	Marhaba Marketing Cooperative	May 31, 2023
	Baker's Fair & Foodmart, Inc.,	May 31, 2023
	Nordon Food Hub	May 31, 2023
	Amree Foodshop	May 31, 2023
	Delaen Farmers Agriculture Cooperative	May 31, 2023
	Gwen's Bakeshop	May 31, 2023
	Zarah's Market Grocery Products Distribution	December 12, 2023
	Calzado General Merchandise	December 12, 2023

Technology	Name	Date Signed
	Maestra Bakeshop	February 09, 2023
	Panahon Bakery	February 21, 2023
	Surio's Bakeshop	February 21, 2023
	J. Celon Bakery	February 21, 2023
	HDRDTsuiteru Food Bar	February 21, 2023
	Olypia's Bakery	February 21, 2023
	Chocovron Global Corp.	February 21, 2023
	GMC Bakery	February 21, 2023
	T.A. Central Metro Foods Inc.	February 21, 2023
	Helen's Candy and Pastries	February 21, 2023
	JCG Marketing Group, Inc.	February 21, 2023
	Iloilo Supermart, Inc.	February 21, 2023
	City College of Calapan	February 21, 2023
	101 Bakeshop	February 21, 2023
	Inang Enyang's Eleven Fourteen Sweet Candies	February 21, 2023
Enhanced Nutribun Carrot Variant	EJ Bakery	February 21, 2023
	Binannuaanan Farmers Community Development Association (BFCDA)	February 21, 2023
	Bantog Samahang Nayon Multi-Purpose Cooperative	February 21, 2023
	ECB Enterprises	February 23, 2023
	Saint John Bakeshoppe	February 23, 2023
	Sir Ezer Bakery	February 23, 2023
	Eastern Primary Multi-Purpose Cooperative	February 23, 2023
	Theresa's Bakeshop	February 23, 2023
	Chef Connie's Resto & Café & Catering Services	February 23, 2023
	Larena Triad Restaurant, Bakeshop & Catering Services	February 23, 2023
	Laizan Foods Corp.	February 23, 2023
	Checacio General Merchandise And Pharmacy	February 23, 2023
	Miguel,Rafael,Gabriel Food Products	February 23, 2023
	Regino's Bakeshop	February 23, 2023

Technology	Name	Date Signed
	Mahintana Foundation Inc.	February 23, 2023
	Constancio's Bakery Products Shop	February 23, 2023
	Glend's Bakeshop And Catering Services	February 23, 2023
	Santa Lucia Bakeshop	February 23, 2023
	Symontash Bakeshop & Catering Services	February 23, 2023
	Pamela's Bakeshoppe	February 23, 2023
	Muggle's Mango Snack House	February 23, 2023
	Mayo Yummy Foods Corporation	February 23, 2023
	Benitta And Flora's Bakery	February 23, 2023
	Jainin's Cakes & Pastries	February 23, 2023
	Nueva Ecija Federation Of Dairy Carabao Cooperative (NEFEDCO)	June 26, 2023
	Baker's Fair & Foodmart, Inc.,	June 26, 2023
	Nordon Food Hub	June 26, 2023
	Amree Bakeshop	June 26, 2023
Enhanced Nutribun Carrot Variant	Gwen's Bakeshop	June 26, 2023
	Balanga Agrarian Reform Beneficiaries Multipurpose Cooperative (BARB)	June 26, 2023
	Marhaba Marketing Cooperative	June 26, 2023
	Panny's Homebake Products, Inc.	June 26, 2023
	Evanrodz Consumer Goods Trading	June 26, 2023
	Calinog Farmers Agriculture Cooperative (CAF-Agri-Coop)	June 26, 2023
	Delaen Farmers Agriculture Cooperative	June 26, 2023
	Efren's Bakery	June 26, 2023
	United Tingguians Multipurpose Cooperative(UTMPC)	July 28, 2023
	City Government Of Bacoor	September 13, 2023
	Zarah's Market Grocery Products Distribution	December 12, 2023
	Four K Kakao Farm	December 12, 2023
	Calzado General Merchandise	December 12, 2023

Technology	Name	Date Signed
	Philippine Nutri-Foods Corporation	February 23, 2023
	Inang Enyang's Eleven Fourteen Sweet Candies	April 18, 2023
	Larena Triad Restaurant, Bakeshop & Catering Services	April 18, 2023
	Iloilo Supermart, Inc.,	April 18, 2023
	GMC Bakery	April 18, 2023
	ECB Enterprises	April 18, 2023
	Saint John Bakeshoppe	April 18, 2023
	Pamela's Bakeshoppe	April 18, 2023
	T.A. Central Metro Foods Inc.,	April 18, 2023
	Helen's Candy and Pastries	April 18, 2023
	Surio's Bakeshop	April 18, 2023
	Laizan Foods Corp.	April 18, 2023
	Baking Pan Bakeshop	April 18, 2023
	Glend's Bakeshop And Catering Services	April 18, 2023
Enhanced Nutribun Sweetpotato Variant	Mahintana Foundation Inc.,	April 18, 2023
	Panaderia Ana	April 18, 2023
	Montes Bakery	April 18, 2023
	Panahon Bakery	April 18, 2023
	Constancio's Bakery Products Shop	April 18, 2023
	Chef Connie's Resto & Café & Catering Services	April 18, 2023
	Muggle's Mango Snack House	April 18, 2023
	Olympia's Bakery	April 18, 2023
	Chocovron Global Corp.	April 18, 2023
	Bantog Samahang Nayon Multi-Purpose Cooperative	April 18, 2023
	Eastern Primary Multi-Purpose Cooperative	April 18, 2023
	Symontash Bakeshop	April 18, 2023
	Santa Lucia Bakeshop	April 18, 2023
	Jainin's Cakes & Pastries	April 18, 2023
	101 Bakeshop	April 18, 2023

Technology	Name	Date Signed
Enhanced Nutribun Sweetpotato Variant	Nueva Ecija Federation Of Dairy Cooperative (Nefedcco)	April 18, 2023
	Regino's Bakeshop	April 18, 2023
	Enriquez & Corozo Food Corporation(ENCOR)	August 23, 2023
	Enriquez & Corozo Food Corporation(ENCOR)	September 13, 2023
	Caraga Adventist Multi-Purpose Cooperative(CAMPCO)	September 13, 2023
	Calinog Farmers Agriculture Cooperative(CAF-Agri-Coop)	September 13, 2023
	Banana Town Bakery	September 13, 2023
	Baker's Fair & Foodmart, Inc.	September 13, 2023
	Amree Foodshop	September 13, 2023
	Galario's Bakery	September 13, 2023
	Evanrodz Consumer Goods Trading	September 13, 2023
	Gwen's Bakeshop	September 13, 2023
	Jeremiah Cakes And Food Services	September 13, 2023
	Ka Popoy's Bakery	September 13, 2023
	Marhaba Marketing Cooperative	September 13, 2023
	Nordon Food Hub	September 13, 2023
	Zarah's Market Grocery Products Distribution	December 12, 2023
	Four K Kakao Farm	December 12, 2023
	Calzado General Merchandise	December 12, 2023

SITE VISITS and MONITORING AND EVALUATION

78 Site Visits

SITE VISITS CONDUCTED

Technology	Name/Address of Adoptor or Licensee	Date
Brown Rice Nutty Fruity Bar	Allycel General Merchandise, La Trinidad Extension, Brgy San Gabriel,Teresa,Rizal	August 4, 2023
Coco Bisc	JBM Food Products, #257 Del Pilar Street, Magdalena, Cabatuan, Isabela	August 1, 2023
Coco Puff and Coco Blend	JBM Food Products, #257 Del Pilar Street, Magdalena, Cabatuan, Isabela	August 1, 2023
Iron Fortified Rice	Rice Processing Complex Davao - Davao Del Sur Federation of Marketing Cooperative (RPC Davao- DASUFEMCO), KOIKA RPC Davao, National Highway, Km. 66, Sinaragan, Matano, Davao Del Sur	March 9, 2023
	Nararagan Valley Multipurpose Cooperative, Nararagan, Balleseros, Cagayan	May 15, 2023
	Victor del Rosario Rice Mill, KM 101 National Highway San Leonardo, Nueva Ecija	May 26, 2023
	Great Foods Concepts, Inc., Brgy. Pagsanga-an, Pavia, Iloilo	July 4, 2023
	Great Foods Concepts, Inc., Brgy. Pagsanga-an, Pavia, Iloilo	August 4, 2023
	Allycel General Merchandise, La Trinidad Extension, Brgy San Gabriel,Teresa,Rizal	August 4, 2023
Iron Rice Premix	Allycel General Merchandise, La Trinidad Extension, Brgy San Gabriel,Teresa,Rizal	August 4, 2023
Rice Mongo Instant Blend and Rice Mongo Curls	ROSHAN FOOD AND BEVERAGE CORPORATION - NUTRINORTH, Zone5 Dalan Matua, Brgy. Maliwalo, City of Tarlac, Tarlac Province	March 30, 2023
	Allycel General Merchandise, La Trinidad Extension, Brgy San Gabriel,Teresa,Rizal	April 4, 2023
	PLGU Zamboanga del Norte, Irasan, Roxas, Zamboanga del Norte	July 26, 2023
	JBM Food Products, #257 Del Pilar Street, Magdalena, Cabatuan, Isabela	August 1, 2023

Technology	Name/Address of Adoptor or Licensee	Date
Rice Mongo Instant Blend and Rice Mongo Curls	Allycel General Merchandise, La trinidad Extension, brgy San gabriel,Teresa,Rizal	August 4, 2023
	Allycel General Merchandise, La trinidad Extension, brgy San gabriel,Teresa,Rizal	August 4, 2023
	LGU- Aroroy, Masbate, Food Processing Center, Aroroy, Masbate	August 22, 2023
Rice-Mongo Complementary Food Products	JBM Food Products, #257 Del Pilar Street, Magdalena, Cabatuan, Isabela	May 24, 2023
Tubig Talino	Bilinbinwang Multipurpose Cooperative, Brgy. Bilibinwang, Agoncillo, Batangas	February 27, 2023
Tubig Talino	Riverside Multi-Purpose Corporation, Bulihan, Nasugbu, Batangas	September 14, 2023
Enhanced Nutribun	102 BAKESHOP, Biñan City, Laguna	January 6, 2023
	LGU-BACOOR CITY, Bacoor City, Cavite	January 6, 2023
	LGU-LOS BAÑOS, National Highway, Timugan, Los Baños, Laguna	January 6, 2023
	HELEN'S CANDY AND PASTRIES, El Salvador, City Misamis Oriental	January 6, 2023
	EASTERN PRIMARY MULTI-PURPOSE COOPERATIVE, #426 Paseo Rueda St. Brgy. Sibut, San Jose City, Nueva Ecija	January 6, 2023
	RANDY BAKESHOP, Lalawigan, Borongan City, Eastern Samar	January 6, 2023
	RLB General Merchandise and Bakery, Brgy. Catmon, St. Bernard, Southern Leyte	January 6, 2023
	THERESA'S BAKESHOP, Brgy. Benedicto, Jaro Iloilo City	January 6, 2023
	BANTOG SAMAHANG NAYON MULTI-PURPOSE COOPERATIVE, Bantog, Asingan, Pangasinan	January 6, 2023
	United Tingguians Multipurpose Cooperative (UTMPC), Pikek, Daguioman, Abra	January 6, 2023
	Tinapayan at Iloilo Supermart Inc.,ICDC Complex, Building 1 Circumferential Road I, Brgy. Tacas, Jaro Iloilo City	January 6, 2023
	REGINO'S BAKESHOP, Brgy. Poblacion East, Bautista, Pangasinan	January 6, 2023
	GMC BAKERY, Barangay Poblacion, Pinamalayan, Oriental Mindoro	January 6, 2023

Technology	Name/Address of Adoptor or Licensee	Date
	CITY COLLEGE OF CALAPAN, Barangay Guinobatan, Calapan City, Oriental Mindoro	January 6, 2023
	OLYMPIA'S BAKERY Highway 3 Barangay Bayanan I, Calapan City, Oriental Mindoro	January 6, 2023
	NORDON FOOD HUB, 8 Aberdeen Street Project 8, Quezon City	January 6, 2023
	LAIZAN FOODS CORP., Interior Dulalia St. Lingunan, Valenzuela City	January 6, 2023
	SAINT JOHN BAKESHOPPE, Inguiling Drive, Poblacion East, Lagawe, Ifugao	January 6, 2023
	JAININ'S CAKES & PASTRIES, Candanay Norte, Siquijor, Siquijor	January 6, 2023
	LARENA TRIAD BAKESHOP/ MARIKART & SNACK BAR, South Poblacion, Larena, Siquijor	January 6, 2023
	PENNY BUN AND BREAD HOUSE, Luha Public Market, Brgy. Mabua, Tandag City	January 6, 2023
	T. A. CENTRAL METRO FOOD INC.,Tomas Cabiles St., San Juan, Tabaco City	January 11, 2023
Enhanced Nutribun	NORDON FOOD HUB, 8 Aberdeen Street Project 8, Quezon City	April 14, 2023
	Bakers Fair, 1020 Oroquieta St. Sta.Cruz, Manila	April 14, 2023
	Bred Velvet Bakeshop, 21 Velvet St. Bonita Hoes Subd. Concepción Dos Marikina City	April 14, 2023
	Remo Variety Store and Bakery, Purok 6 Zone 2 Mahabang Parang, Agono, Rizal	April 14, 2023
	LGU-BACOOR CITY, Bacoor City, Cavite	April 14, 2023
	SATOCA Agrarian Reform Cooperative, Sagay City, Negros Occidental	April 14, 2023
	Balanga Agrarian Reform Beneficiaries Multipurpose Cooperative, Banzon Street, Upper Tuyo, Balanga, Bataan	April 14, 2023
	RLB General Merchandise and BakeryBrgy. Catmon, St. Bernard, Southern Leyte	April 14, 2023
	Penny Bun and Breadhouse, Luha Public Market, Brgy Mabua, Tandag City	April 14, 2023
	Gwen's Bakeshop, St. Joseph Street, Rocka Village, Tabang Plaridel, Bulacan	April 14, 2023

Technology	Name/Address of Adoptor or Licensee	Date
	Efren's Bakery, 344 Mabini St., Brgy. 1 Baler, Aurora	April 14, 2023
	Lake Lanao Native Souvenir Producer Cooperative, Brgy. Campung Talao, Tugaya, Lanao del Sur	April 14, 2023
	Marhaba Marketing Cooperative, Brgy. Pawak, Saguiaran, Lanao del Sur	April 14, 2023
	New Cardinal Bakeshop, San Nicolas Corner Kamo St., Surigao City	April 14, 2023
	Evanrodz Consumer Goods Trading, Purok 1, Mesaoy, New Corella, Davao del Norte	April 14, 2023
	Panny's Homebake Products, Inc., Brgy. Ibarra, Maasin City, Southern Leyte	April 14, 2023
	AMREE Bakeshop, A. B. Fernandez Avenue, Dagupan City, Pangasinan	April 14, 2023
	Delaen Farmers Agriculture Cooperative, Zone 6B, Barangay Abar 2nd, San Jose City, Nueva Ecija	April 28, 2023
Enhanced Nutribun	Divina Pastora Multipurpose Cooperative, Mangino, Gapan City	April 28, 2023
	Simula ng Panibagong Bukas Multipurpose Cooperative, Porais, San Jose City, Nueva Ecija	April 28, 2023
	Kaagapay sa Pag-Unlad ng Mamamayan Producers Cooperative, Purok Plaridel, Cebu, Cabanatuan City, Nueva Ecija	April 28, 2023
	Calinog Farmers Agriculture Cooperative, Barangay Simsiman Calinog, Iloilo	April 28, 2023
	ECB Enterprises	April 28, 2023
	Gasa Small Batch Chocolate, Zamboanga del Sur	April 28, 2023
	Scones and Muffins Bakeshop, Lucena City, Quezon Province	August 15, 2023
	Zarah's Market Grocery Product Distribution, Campu	August 15, 2023
	Calzado General Merchandize, 3.5 Sitio Dilain, Valley Golf, Cainta Rizal	September 22, 2023

Technology	Name/Address of Adoptor or Licensee	Date
Enhanced Nutribun	Philippine Foremost Milling Corporation, Lot 6 & 7, B2 Manila Harbour Centre, Radial Road 10, Vitas, Tondo, Manila, Metro Manila	December 6, 2023
	FB Star Food House, Corner Lanzones St., Arago Subdivision Triangulo, Naga City	December 6, 2023
	Lake Lanao Native Souvenir Producer CooperativeBrgy. Campung Talao, Tugaya, Lanao del Sur	December 6, 2023
	RLB General Merchandise and Bakery, Brgy. Catmon, St. Bernard, Southern Leyte	December 6, 2023
	Simula ng Panibagong Bukas Multipurpose Cooperative, Porais, San Jose City, Nueva Ecija	December 6, 2023
	Satoca Agrarian Reform Cooperative, Sitio, Matiklohod, Barangay campo Homoga-an, Sagay City	December 6, 2023
	Bred Velvet Bakeshop, 20 Sumulong Highway Sto. Niño, City of Marikina	December 6, 2023
	Catalanacan Multipurpose Cooperative, Nueva Ecija	December 6, 2023
	MROY Incorporated, P-13 A, Poblacion, Valencia City, Bukidnon	December 6, 2023
	C.T. Silva Bakery, San Juan Ave., North Centro, Sipocot, Camarines Sur	December 6, 2023

53 **Licensees monitored and evaluated**

MONITORING AND EVALUATION OF LICENSEES CONDUCTED

Technology	Name of Company	Date
Carrot-Mango Concentrate and Ready-to-Drink Green Mango Juice	Trappist Monastic Food Products	October 24, 2023
Complementary Food	Actions Hub Philippines, Inc.	February 21, 2023
Iron-Fortified Rice	CAMSUR Multi-Purpose Cooperative	October 24, 2023
	Esteems Industries Inc.	October 24, 2023
	Aicee Catering Food Services	October 24, 2023
	LGU City of Navotas	October 24, 2023
	Enmiri Corporation	October 24, 2023
	SwissPharma Research Laboratories	October 26, 2023
	Palawan Arc Cooperative Federation (PARCOFED)	October 26, 2023
	Great Foods Concepts, Inc.	October 26, 2023
	D' Paragon AA Corp.	October 26, 2023
	Antofel Trading	October 26, 2023
	FRT Rice Mill	October 26, 2023
Iron-Fortified Rice & Iron Rice Premix	Ma-an's Bakeshop Corporation	October 24, 2023
	Allycel General Merchandise	October 26, 2023
	Nutridense Food Manufacturing Corporation	October 26, 2023
	CM & Sons Food Products, Inc.	October 26, 2023
	Nutrition and Beyond Corporation	October 26, 2023
	Aretei Food Corporation	October 26, 2023
Rice-Mongo Blend	Negrense Volunteers for Change (NVC) Foundation, Inc.	August 16, 2023
Enhanced Nutribun	Ma-an's Bakeshop	February 24, 2023
	Carry's Bakeshop	March 6, 2023
	Panaderia Ana	March 6, 2023
	Pan Ni Juan	March 6, 2023
	Reid Bakeshop and Party Needs	March 6, 2023

Technology	Name of Company	Date
	Arteche Bread Haus	March 6, 2023
	Hans Cakes and Pastries	March 6, 2023
	Mam Dit's Baker's Corner	March 6, 2023
	Wooden Bakery and General Merchandise	March 6, 2023
	AE Enterprises	March 6, 2023
	Rodriguez Burger and Bread Corporation	March 6, 2023
	Allycel General Merchandise	May 10, 2023
	J.A. Fruits & Vegetable Processing	June 5, 2023
	Marylois Food Products & Merchandising	June 5, 2023
	Honey Buns Bakeshop	June 5, 2023
	JBM Food Products	June 5, 2023
	Provincial Local Government Unit Of Quirino / Quirino Livelihood For Everyone (Q-LIFE)	June 05, 2023
	Susan's Bakeshop	June 6, 2023
Enhanced Nutribun	Piazza Zicarelli Hotel	June 6, 2023
	Paige's Bakery Product Shop	June 6, 2023
	Cup And Saucer Bakery	June 6, 2023
	Johann's General Merchandise	August 9, 2023
	Bestfriend Goodies	August 9, 2023
	D'Hermanos Pizza	August 9, 2023
	Delta Business Ventures	August 9, 2023
	Heaven's Bakehaus & Enterprises	August 9, 2023
	La Elena Pension House Rental	August 10, 2023
	Mama Nene's Homemade Delights	August 10, 2023
	SG Business Ventures Inc.	August 10, 2023
	The Life Giving Products & Specialty (MANHU-The Lifegiving Bread) Corp.	August 10, 2023
	Yum Breadhauz Products	August 10, 2023
	Helen's Candy and Pastries	August 10, 2023
	Office of Quezon 4th District Representative(Four K Kakao Farm)	September 14, 2023

UTILITY MODELS, COPYRIGHTS, AND TRADEMARKS

47 **Approved utility models, copyrights, and trademarks**

APPROVED UTILITY MODELS

Title	Registry No.	Name of Researcher/ Inventor/Agency	Date Approved
Process of Producing Fortified Protein Cookie	2-2020-051174	MSaises, APadrones, TKJolejole, AUmali, JL Ramirez, RSabado, JLala	January 4, 2023
Fortified Protein Cookie	2-2020-051175	MSaises, APadrones, TKJolejole, AUmali, JL Ramirez, RSabado, JLala	January 4, 2023
Enzyme-treated Nutritional Formula for Enteral Feeding filed as "Enteral Formula"	2-2023-050134	APalomo, JPalafox, Engr. CAdona, RPanis, FPonte, RAduana	March 13, 2023
Ready-to-Eat Cereal Composition Fortified with Resistant Starch	2-2023-050136	TArcangel, VRamas, JlRamirez, JVTiama, RPayag	March 13, 2023
Process for Producing Ready-to-Eat Cereal Composition Fortified with Resistant Starch	2-2023-050137	TArcangel, VRamas, JlRamirez, JVTiama, RPayag	March 13, 2023
Complementary Snack Food with Coconut filed as "Extruded Snack Food with Coconut Flour"	2-2023-050138	APalomo, Vamas, CSaldaña, CAdona, lAngeles-Agdeppa, Ph.D., RAduana, JPalafox, FPonte	March 8, 2023
Process for Producing Extruded Snack Food with Coconut Flour	2-2023-050139	APalomo, VRamas, CSaldaña, Engr. CAdona, lAngeles-Agdeppa, Ph.D., RAduana, JPalafox, FPonte	March 31, 2023
Complementary Baby Food Blend with Coconut filed as "Instant Baby Food Powder with Coconut Flour"	2-2023-050140	APalomo, VRamas, CSaldaña, Engr. CAdona, lAngeles-Agdeppa, Ph.D., RAduana, JPalafox, FPonte	March 31, 2023
Process for Producing Instant Baby Food Powder with Coconut Flour	2-2023-050141	APalomo, VRamas, CSaldaña, Engr. CAdona, lAngeles-Agdeppa, Ph.D., RAduana, JPalafox, FPonte	March 31, 2023

Title	Registry No.	Name of Researcher/ Inventor/Agency	Date Approved
Process of Preparing Coconut Milk-Dairy Blends filed as "Process for Producing Ready-to-Drink Milk Beverage"	2-2023-050142	APadrones, RAlcaraz, AUmali, JLala, MAlbao, Engr. CAdona, IAngeles-Agdeppa, Ph.D., BDMEspelio, JLala, RPanis	March 31, 2023
Coconut Milk-Cow's Milk Blend filed as "Ready-to-Drink Milk Beverage Made of Coconut Milk and Cow Milk"	2-2023-050143	APadrones, I Angeles-Agdeppa, Ph.D., RAlcaraz, MAlbao, Engr. CAdona, AUmali, BDMEspeno, JLala, MSaises	April 24, 2023
Coconut Milk-Goat's Milk Blend filed as "Ready-to-Drink Milk Beverage Made of Coconut Milk and Goat Milk"	2-2023-050145	APadrones, I Angeles-Agdeppa, Ph.D., RAlcaraz, MAlbao, Engr. CAdona, AUmali, BDMEspeno, JLala, MSaises	April 24, 2023
Process of Producing an Enteral Formula	2-2023-050149	APalomo, JPalafox, CAdona, RPanis, FPonte, RAduana	May 3, 2023

APPROVED COPYRIGHTS

Title	Registry No.	Name of Researcher/ Inventor/Agency	Date Approved
Technology Manual: Coco Puff & Coco Blend	O2023-286	APalomo, VRamas, CSaldaña, Engr. CAdona, Filoteo D. Ponte, Robert G. Aduana, Johnellie S. Palafox	February 3, 2023
Technology Manual for the Production of Coco-dairy Milk Blends	O2023-287	APadrones, IAngeles-Agdeppa, Ph.D., RAlcaraz, Engr. CAdona, AUmali, BDMEspeño, MAlbao, RPanis	March 2, 2023
NUTRINET 35th Anniversary Souvenir Program	O2023-288	DDe Leon, GBAbad	March 2, 2023
Technology Manual on the Production of MGM-15 for Pregnant and Lactating Mothers	O2023-289	APadrones, Alcaraz, Engr. CAdona, AUmali, BDMEspeño, MAlbao, JLala, RPanis	March 2, 2023
NUTRINET 30th Anniversary Souvenir Program	O2023-290	DDe Leon	March 2, 2023
NUTRINET 25th Anniversary Souvenir Program	02023-291	DDe Leon	March 2, 2023
Testimonial Video of former NUTRINET members	L2023-16	DDe Leon, GJAbad	March 3, 2023

Title	Registry No.	Name of Researcher/ Inventor/Agency	Date Approved
Behind Numbers: Compilation of Food and Nutrition Media Collaterals	L2023-17	SSerrano, IGlorioso, MGonzales Ph.D., AOrtiz, NBristol, JGonzales, LLandicho, DDe Leon, MBDecena, SFArevalo, ENBacolod, JMVillanueva	March 3, 2023
NUTRINET 35th Anniversary Audio-Visual Presentation	L2023-18	DDe Leon, JMVillanueva, GJAbad, MBDecena	March 3, 2023
Your Safety Guide to Exercise and Sports	I2023-03	MMadrid, NLSantos, SCarandang, LGalon, HLat, JPLabrador	March 21, 2023
Your Guide to An Active Lifestyle	I2023-04	MMadrid, NLSantos, SCarandang, LJGalon, HLat, JPLabrador	March 21, 2023
60-Minute Challenge - Make Physical Activities Become Your Daily Habit	I2023-05	MMadrid, NLSantos, SCarandang, LJGalon, HLat, JPLabrador	March 21, 2023
Technology Manual for the Production of Multi-Nutrient Extruded Rice Kernel-11 (MNERK-11) for Pregnant and Lactating Mothers	O2023-289	APadrones, RAlcaraz, Engr. CAdona, AUmali, BDMEspeño, MAlbao, JLala, RPanis	March 21, 2023
Technology Manual: Coco Bisc	A2023-738	APalomo, VRamas, CSaldaña, Engr. CAdona, FPonte, RAduana, JPalafox	March 21, 2023
Ang Mahiwagang Pinggang Pinoy ng Nutrilandia Chapter 2	L2023-34	IGlorioso, SFArevalo, CLBayalas, ENBacolod, MGonzales, Ph.D.	March 22, 2023
Ang Mahiwagang Pinggang Pinoy ng Nutrilandia Chapter 3	L2023-35	IGlorioso, SFArevalo, CLBayalas, ENBacolod, MGonzales, Ph.D.	March 22, 2023
Physical Fitness Tests for Adolescents An Instructional Guide for Educators (English Version)	L2023-61	MMadrid, NLSantos, HLat, JPLabrador, SCarandang, LjGalon, AlDalisay, JCDe Torres, PTrinidad	April 24, 2023
Physical Fitness Tests for Adolescents An Instructional Guide for Educators (Filipino Version)	L2023-62	MMadrid, NLSantos, HLat, JPLabrador, SCarandang, LjGalon, AlDalisay, JCDe Torres, PTrinidad	April 24, 2023
Squash Puree 90 Technology Manual	O2023-1447	Engr. CAdona, JTagaroma, RATeodoro, ERamirez, FLGarcia, RAlcaraz, FPonte, RCastante, CSaldaña	April 27, 2023

Title	Registry No.	Name of Researcher/ Inventor/Agency	Date Approved
2023 Menu Guide Calendar " Healthy Snacks and Beverages for Adults"	O2023-1448	MAGironella, IGlorioso, EAArnejo, SFArevalo, ENBacolod, JMVillanueva, VVSalazar, JDCabillon, CLBayalas, MCPalompo, ERebato, MGonzales, Ph.D.	April 27, 2023
Supporting Adolescent Growth in the Philippines Nutrition and Food Safety Assessment Activity 1 (Version 1)	I2023-40	NLSantos, HLat, KKCastilla, MMadrid, JPLabrador, ALDalisay, JCDe Torres	September 21, 2023
Supporting Adolescent Growth in the Philippines Nutrition and Food Safety Assessment Activity 2 (Version 1)	I2023-41	NLSantos, HLat, KKCastilla, MMadrid, JPLabrador, ALDalisay, JCDe Torres	September 21, 2023
Supporting Adolescent Growth in the Philippines Nutrition and Food Safety Assessment Activity 3 (Version 1)	I2023-39	NLSantos, HLat, KKCastilla, MMadrid, JPLabrador, ALDalisay, JCDe Torres	September 21, 2023
Project on Supporting Adolescent Growth in the Philippines: Student Planner	A2023-2424	NLSantos, HLat, KKCastilla, MMadrid, JPLabrador, ALDalisay, JCDe Torres	September 21, 2023
eKusina - Carrot Tupig	L2023-212	MAGironella, IGlorioso, EAArnejo, SFArevalo, ENBacolod, JMVillanueva, VVSalazar, JDCabillon, CLBayalas, MCPalompo, ERebato, MGonzales, Ph.D.	September 21, 2023
eKusina - No Fry Empanada	L2023-214	MAGironella, IGlorioso, EAArnejo, SFArevalo, ENBacolod, JMVillanueva, VVSalazar, JDCabillon, CLBayalas, MCPalompo, ERebato, MGonzales, Ph.D.	September 21, 2023

Title	Registry No.	Name of Researcher/ Inventor/Agency	Date Approved
eKusina - Soya-Bano Shake with Chia Seeds	L2023-215	MAGironella, IGlorioso, EAArnejo, SFArevalo, ENBacolod, JMVillanueva, VVSalazar, JDCabillon, CLBayalas, MCPalompo, ERebato, MGonzales, Ph.D.	September 21, 2023
eKusina - Watermelon-Upo Juice	L2023-213	MAGironella, IGlorioso, EAArnejo, SFArevalo, ENBacolod, JMVillanueva, VVSalazar, JDCabillon, CLBayalas, MCPalompo, ERebato, MGonzales, Ph.D.	September 21, 2023
OPTIDIETS® Software	N2023-192	CVCabanilla, RCTan, MLCumagun, MAGironella, CJavier, EAArnejo, MSerafico, RGarcia, MCapanzana, CDuante, MLDasco	December 18, 2023
Training Manual on Microbiological Methods for Food Analysis	A2023-3120	CESevilla, DACaballes, RDumag	December 18, 2023
Electronic Data Collection System	N2023-194	MAJavier, IAngeles-Agdeppa, Ph.D., CDuante, RCBrosa, CGonzales, AVerana, OJde Leon	December 18, 2023
Dietary Data Collection System (DDCS)	N2023-193	MAJavier, IAngeles-Agdeppa, Ph.D., CDuante, EGoyena, Ph.D. JDesnacido, MMagnaye, Jr., APApolinar, KAKua	December 18, 2023

APPROVED TRADEMARKS

Title	Registry No.	Name of Researcher/ Inventor/Agency	Date Approved
CocoDairy Coconut Milk - Cow's Milk Blend (Figurative Mark)	4-2023-507815	APadrones, IAngeles-Agdeppa, Ph.D., RAlcaraz, Engr. CAdona, AUmali, BDMEspeño, MAlbao, and RPanis	March 9, 2023
Behind Numbers (Figurative Mark)	4-2023-507816	NBristol, SSerrano, IGlorioso, MGonzales Ph.D.	April 4, 2023

LABORATORY SERVICES

The DOST-FNRI Service Laboratory served **307 customers** including firms, researchers, and students. With these biological, chemical and microbiological analyses, the DOST-FNRI-SL generated income amounting to **Php 2,044,862.00.**

KPIs	BIO	CHEM	MIC	TOTAL
No. of samples received	967	315	350	1,632
No. of tests conducted				
Service Laboratory	1,403	1,763	1,007	4,173
NNS	297,708	27,212	-	324,920
No. of customers served	52	135	120	307
No. of new customers served		70		70
No. of firms served		82		82
Total fees collected				
Cash	Php 275,720.00	Php 1,332,352.00	Php 436,790.00	Php 2,044,862.00
In-kind	Php 555,290.00	Php 175,284.00	Php 26,050.00	Php 756,624.00
Value for Assistance - Discounts	Php 7,956.00	Php 89,400.00	Php 47,620.00	Php 144,976.00
Value for Assistance - Gratis (Free)	Php 92,160.00	Php 1,898,745.00	Php 711,640.00	Php 2,702,545.00
Value for Assistance - NNS	Php 89,123,756.00	Php 8,091,300.00	-	Php 97,215,056.00

LIBRARY SERVICES

Dexter Y. De Leon, Glenn Joy B. Abad, Salvador R. Serrano, and Milflor S. Gonzales, Ph.D.

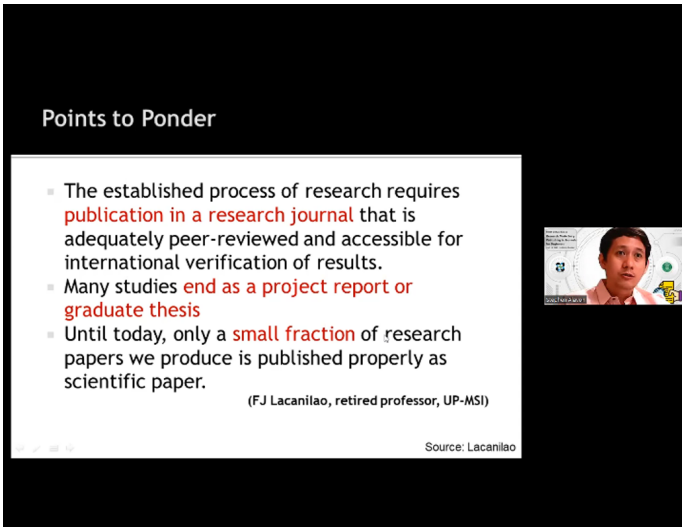
Food and Nutrition Information Resource Station (FIRSt) Services

The DOST-FNRI Food and Nutrition Information Resources Station (FIRSt) provided information services to 57 walk-in clients and served 523 online clients. It also catered to 1,007 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 (face-to-face), FIRSt Virtual Space, and Digitization.

The FIRSt Services Orientation provides an overview about FIRSt and its services which includes information about the operating hours, location, staff, contact details and the collection. The orientations conducted included:

- DOST - Philippine Council for Industry, Energy and Emerging Technology Research & Development (PCIEERD) Scholars– March 21, 2023;
- DOST - Philippine Council for Health Research & Development (PCHRD) Scholars – March 24 and August 15, 2023;
- Philippine Science High School-Ilocos Region Campus – April 27, 2023;
- Mindanao State University – May 4, 2023;
- Lyceum of the Philippines Cavite – May 11 and 18, 2023;
- University of the Phillippines Diliman – October 19, 2023; and
- St. Francis of Assisi College - Las Piñas – October 24, 2023.



The FIRSt Virtual Space is a webinar which aims to educate researchers and technical writers of the Institute about effective research. On April 13, 2023, the FIRSt Virtual Space on Publishing in Journals for Beginners was conducted via Zoom. It was attended by 75 DOST-FNRI staff.

Lastly, one of FIRSt's goals is to preserve DOST-FNRI's publications for the present and future generation of researchers inside and outside the Institute to use it for reference. A total of 101 FIRSt Collection including publications, theses and dissertations were digitized in 2023.

Nutrition Research Information Network (NUTRINET)

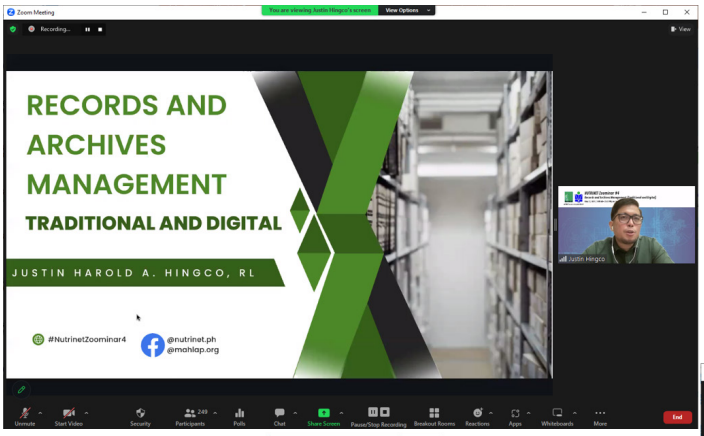
The Nutrition Research Information Network (NUTRINET), in partnership with Medical and Health Librarians' Association of the Philippines (MAHLAP), organized the NUTRINET Zoominar. It is a webinar for librarians and information professionals to continuously learn concepts and enhance skills amidst the pandemic.

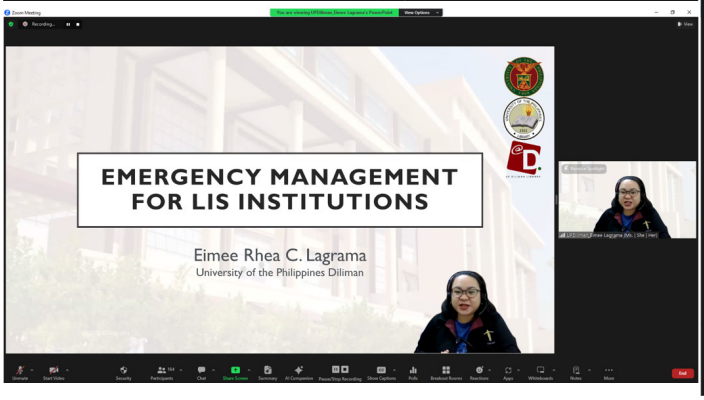
For 2023, NUTRINET and MAHLAP organized two Zoominars. The first was conducted on May 12, 2023 via Zoom titled the NUTRINET Zoominar #4: Records and Archives Management (Traditional and Digital). Mr. Justin Harold A. Hingco, Records Officer III of Bangko Sentral ng Pilipinas and ASLP Board of Director, served as the resource person of the webinar.

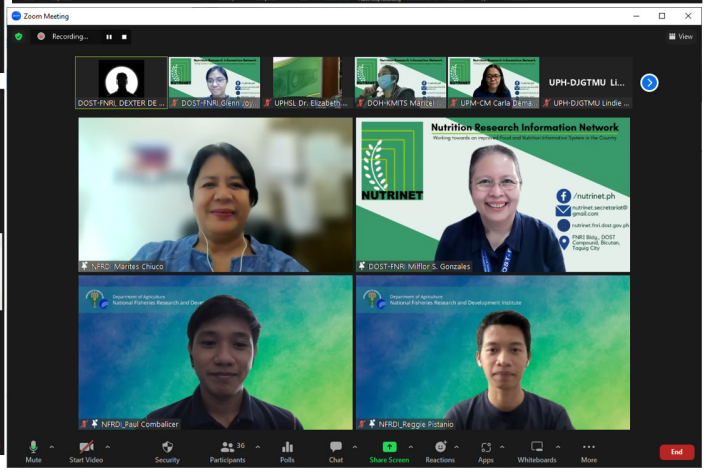
The second was NUTRINET Zoominar #5: Disaster Planning for Libraries conducted on December 7, 2023 via Zoom. Ms. Eimee Rhea C. Lagrama, Deputy University Librarian, UP Diliman was the resource person of the webinar.

On June 21, 2023, an Adopt-A-Library (AAL) virtual monitoring was conducted with the librarians of Cavite State University – Naic Campus 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 and coordinate other means on how NUTRINET can be of assistance to the adopted library.

For 2023, Department of Agriculture – National Fisheries Research and Development Institute (DA-NFRDI) joined NUTRINET. ■







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	Total
Speakers	79
Participant/Exhibitor	286
Demonstrator	19
Judge/Panelist	8
Emcee/Moderator/Facilitator	2
Consultant	171
Editorial Board Member	1
Reviewer	28
Marketing Initiatives (Pitching session, F&N Talks, BREAK, etc.)	14

SOCIAL MEDIA METRICS

The Institute leverages social media insights to enhance its mission of promoting nutrition and health awareness. These insights guide the development of targeted campaigns, ensuring that information reaches the right audience effectively. DOST-FNRI aims to foster a well-informed public, driving positive changes in dietary habits and health outcomes through strategic social media use.

MULTIMEDIA NUTRITION PROMOTION (MEDIA MILEAGE)

The Institute gained a media mileage value of Php 1.2B for 2023. This amount came from news items featuring DOST-FNRI's R&D outputs and S&T services, through citations (data, research results), event coverage (FSS, forum), and media interviews conducted.

DOST-FNRI appeared on news items broadcasted on Television (150 times) and Radio (162 times) and was featured in 221 print media news items. Moreover, the Institute's R&D outputs and S&T services appeared in 520 news items disseminated on online news sites. This media mileage also came from media interviews rendered by DOST-FNRI experts (58 media interviews).

OH MY GULAY! SA FNRI

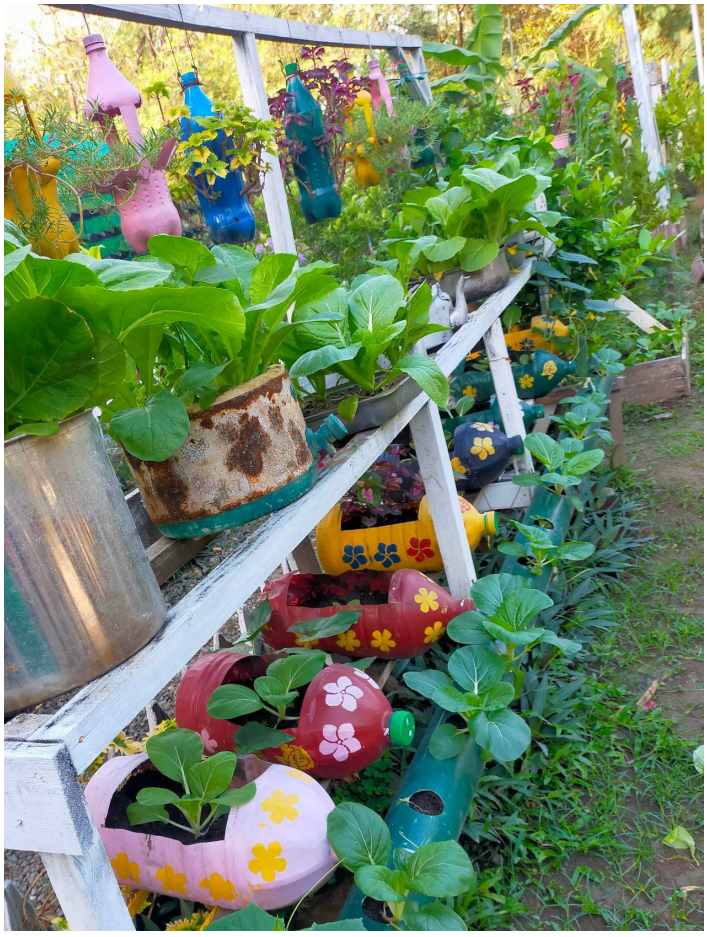
Idelia G. Glorioso, Dexter Y. De Leon, Shannen Faye Q. Arevalo, Christelle Lois T. Bayalas, Ma. Corazon E. Palompo, Lucito A. Sila, Erika Niña C. Bacolod, John Mark M. Villanueva, and Milflor S. Gonzales, Ph.D.

The Oh My Gulay! sa FNRI demonstrates a sustainable workplace garden in encouraging employees to start urban gardening and increase their vegetable consumption.

In 2023, the OMG garden featured vegetables that can be used for Visayan Vegetable Dish Recipes. For each quarter, the garden focused in planting the vegetable ingredients of the Visayan dishes. The featured recipes were Utan-Bisaya (Law-uy), Tinuwang Isda, Halang-halang and Inun-unan. The theme was intended to promote and introduce various dishes from the Visayan Region.

The upcycled-themed corner was also one of the features in the OMG garden which started in 2022, this corner was to encourage employees to start and design their own urban garden using materials found in the kitchen like pots, kettle, colander, etc. as gardening containers.

For 2023, the total volume production of harvested fruits and vegetables was 945.930kg with an estimated revenue amount of PhP 104, 545.25. These were given for free to DOST-FNRI employees as ayuda and as tokens for visitors of the Institute.



Furthermore, there was a distribution of free vegetable seedlings (*kamatis, sili, okra, talong, pechay, pipino* etc.) to the employees to sustain their interest in growing vegetable plants in their home. Briefing orientations and OMG tours were also conducted to various schools, universities and visitors of the institute.

The OMG garden continues to be an inspiration to improve household food security and encourages FIlipinos in cultivating their very own urban edible garden. ■

New Information, Education, Communication (IEC Packages) and Other Innovative Strategies

Idelia G. Glorioso, Dexter Y. De Leon, Shannen Faye Q. Arevalo, Erika Niña C. Bacolod, John Mark M. Villanueva, Christelle Lois T. Bayalas, Jefferson Butch C. Obero, Ma. Corazon E. Palompo, and Milflor S. Gonzales, Ph.D.

To help create awareness and knowledge on food and nutrition, the DOST-FNRI develops, pre-tests and evaluates print (e.g. flyers, brochures) and non-print (e.g. videos/MTVs) nutrition information packages in print and digital (ecopy) formats.

In 2023, a total of 41 IEC packages were developed to educate various stakeholders. These include new materials like nutrition cartoon on eating vegetables and Eats Fun: Educational Games for Kids. The regular materials included: Annual Report, FNRI eDigest, FNRI eUpdates, eBook of Abstracts and Souvenir Program, Menu Guide Calendar, Desk Calendar, eKusina videos and MTVs on food and nutrition.

A nutrition cartoon titled Luntian: *Ang Pag-usbong ng Malulusog na Lahi* was also developed to encourage kids to eat fruits and vegetables. The story is about the town of *Mayna* wherein the inhabitants are weak and sluggish. *Makisig* and *Mayumi* are the main characters of the story who are strong and healthy because they are fond of eating fruits and vegetables. They want to save the town of *Mayna* from *Asteneya*, who spread diseases to the town.

Moreover, Eats Fun: Educational Games for Kids is a compilation of five nutrition games namely the healthy brain, nutriquest, nutrition snakes and ladder, nutrition maze, and nutrition alphabet.

The 2024 desk calendar was developed by DOST-FNRI in partnership with Robinsons Supermarket. The calendar features seasonal fruits and vegetables that can help maintain a strong immune system for today's demanding lifestyle. Included in the desk calendar are twelve (12) easy-to-prepare healthy snacks and thirst-quenching beverages that are made with affordable and readily available ingredients.

The 2024 Menu Guide Calendar features fourteen (14) innovative food recipes developed by the DOST-FNRI that can help homemakers and individuals in preparing recipes for hypertensive adults. This calendar can guide nutrition and health workers and caregivers in planning the diet of hypertensive individuals. In addition to the appetizing recipes, the calendar included valuable tips in managing hypertension by reducing sodium in the diet, reading food product labels, and guide to healthy salt alternatives, among others. Four (4) week, seven (7)-day cycle menus are also included in the calendar.

Cycle Menu Week 1

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Breakfast	Pork *molo* soup with *kulitis* Boiled rice Orange juice	Chico Tomato-onion-cucumber salad Fried *galunggong* Boiled rice Coffee	Apple and lettuce salad Pan-fry homemade burger-veggie patty Boiled rice Tea	*Nilagang saba* Shrimp fried rice with corn, carrots and peas Hot choco	Ripe mango *Ginisang sayote at itlog* with ground pork Boiled rice Coffee	Apple Chicken-egg-tomato-*pechay burrito* Tea	Pankan *Bistek na tilapia* with onion rings Boiled rice Low fat milk
AM Snack	*Tikoy* rolls	Grilled yellow corn	*Ube piaya*	Granola bar	Choco-banana crepe	Banana muffin	Apple pie
Lunch	Kung Pao chicken with steamed *bokchoy* Boiled rice Chilled *langka*	***Halaan* with corn and malunggay leaves*** Boiled rice *Minatamis na saba*	Pan-grilled *tanigue* *Dinengdeng na papaya at saluyot* Boiled rice *Mais con yelo*	Creamy pork meatballs with mushroom sauce and steamed *pechay* Boiled rice Watermelon shake	Pan-fried chicken with honey garlic sauce Sautéed cabbage and carrots Boiled rice *Buko* juice	Stir-fried green beans with *tokwa* and *tausi* Boiled rice Fresh strawberry	*Sinabawang* pork ribs *sa kamatis* Boiled rice Chico
PM Snack	*Nilupak*	Boiled sweetpotato	*Espasol*	*Lumpiang sariwa* with peanut sauce	*Pansit bihon guisado*	*Saba con yelo*	*Kalamay*
Dinner	Grilled *munggo*-veggie patties Boiled rice Fruity *gulaman*	Cabbage and pork soup with quail eggs Boiled rice Mango shake	***Dalandan* chicken skewers** Boiled rice Pomelo	*Patola*-mushroom egg drop soup Tofu and chickpea *sisig* Boiled rice *Dalandan*	**Cabbage and beef rolls** Boiled rice Pineapple	*Sinaing na tulingan* Steamed *kangkong* Boiled rice Ripe papaya	Roasted chicken with pesto sauce Boiled rice Mango-banana shake

Sautéed kidney beans and chinese cabbage

Serving Size: 1 ½ cups

Number of Servings	Preparation Time	Cooking Time
5	10 mins.	45 mins.

Ingredients:

1 ½ cups	Kidney beans, red
7 cups	Water
1 Tbsp	Cooking oil
¼ cup	Garlic, chopped
¼ cup	Onion, red, chopped
½ cup	Pork, *kasim*, ground
½ cup	Bell pepper, red, chopped
5 cups	*Pechay Baguio*, chopped
2 Tbsps	Soy sauce
¼ tsp	Black pepper, ground
1 cup	Water

Procedure:

1. Boil the kidney beans:
   - In a covered pan, boil red beans in water over medium fire for 45 minutes or until tender. Drain. Set aside.
2. In a pan, heat oil. Sauté garlic, onion, and pork. Cook for 5 minutes.
3. Add cooked kidney beans, bell pepper, *pechay Baguio*, soy sauce, pepper, and water. Stir and cook for 5 minutes.

NUTRITION INFORMATION PER SERVING

353 kcal

Protein	16.3 g		
Total Fat	12.8 g		
Saturated Fat	5.3 g		
Cholesterol	17 mg		
Total Carbohydrates	43.2 g		
Dietary Fiber	10.1 g		
Sodium	152 mg		
% Contribution*			
Calcium	24%	Vit. A	7%
Iron	48%	Vit. C	63%

*Based on the Philippine Dietary Reference Intake (PDRI) 2015 for 19-29 years old, male

₱ 33.00 per serving

RECIPE TRIVIA

Beans are good alternatives to meat as these provide protein, iron and potassium but are low in fat.

For 2023, the Institute generated income of Php 373,809.00 through the sales of IEC materials. The Institute's partners in disseminating the Institute's IEC packages are the DOST-Regional Office XI; Nutrition Center of the Philippines; DSWD Field Office V; LGU Valenzuela; LGU Camarines Sur; Municipality of San Fernando, Camarines Sur; LGU Las Piñas; UST; and ACL Drygoods and General Merchandise. ■

49th DOST-FNRI Seminar Series: A Continuing Commitment in Disseminating Science-based Food and Nutrition Information

The DOST-FNRI in partnership with the FNRI Employees' Association Inc. (FNRI EA Inc.) conducted the 49th FNRI Seminar Series on July 5-6, 2023. This year's theme "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services" was in support of the July 2023 National Nutrition Month theme: "Healthy Diet Gawing Affordable for All". Rising from limitations brought about by the COVID-19 pandemic in the last two (2) years, the 2023 FSS was conducted face-to-face at the Dusit Thani Manila, Makati City. The event was attended by 278 participants representing 14 of the 17 regions in the country and including seven participants from the United States of America (USA). The pre-event on the Undergraduate Student Research Competition, held in June 23, 2023 via zoom, was attended by 78 participants.

In addition to the paid participants, more than 50 guests also graced the event. These comprised of high-level officials from the Department of Science and Technology (DOST) headed by Secretary Renato U. Solidum, Jr. and the different Under Secretaries, Assistant Secretaries, and Directors of DOST councils and research and development institutes (RDIs). Also present were representatives from both the Senate and House of Representatives, from the National Government Agencies such as the Department of Health (DOH), Department of Social Welfare and Development (DSWD), National Nutrition Council (NNC), Department of Interior and Local Government (DILG), and Department of Agriculture (DA), and the Professional Regulations Commission Board of Nutrition and Dietetics. Representatives from International and Non-government Organizations including the World Health Organization (WHO), World Food Programme (UNWFP), Helen Keller International, Children's First One Thousand Days Coalition, from the academe, food industries, and business adoptors of the DOST-FNRI technologies also attended the event. Furthermore, a total of 14 representatives from different media outfits covered the event and aired the interviews of DOST Secretary Solidum

and DOST-FNRI Director Imelda Angeles-Agdeppa in the evening television news programs on July 5-6, 2023.

During the opening program, in-person and recorded messages of inspiration and support from honored guests and key officials of DOST, DSWD and Senate of the Philippines were among the highlights. The Inspirational Message was given by DOST Secretary Dr. Renato U. Solidum, Jr. The Keynote Speaker was Senator Francis "Tol" N. Tolentino, represented by his Chief of Staff, Mr. Francisco Ashley Acedillo. These were followed by the recorded messages of Dr. Leah J. Buendia, DOST Undersecretary of R&D and a Message to our Partner LGUs by DILG USec Mario Iringan.

For the technical sessions, highlights of 23 out of the 52 completed projects in 2022 were presented during the Plenary Session and six (6) technical sessions. The plenary session billed as "Real Talk: Usapan at Talakayang Pangkalusugan" had two parts. Part 1 on "Tools to develop a healthy and affordable diet: Ano ang bago? included two studies on OPTIDIETS: Optimization of Low-Cost, Nutritionally Adequate Diets for Filipinos Using a Web-based Analysis Tool and Development and Field Testing of the Philippine Nutrient Profile Model. The second part of the Plenary Session was titled Healthy Diet: Ang pagsusuri sa halaga ng isang "adequate diet" at paano ipapalaganap ang impormasyon? Distinguished reactors from World Food Program (WFP), World Health Organization (WHO), Department of Social Welfare and Development (DSWD) DZRV Radio Veritas Station were invited to give their insights on the results of the studies.

The six (6) technical sessions featured three (3) study presentations per session except for Technical Session 4 with four (4) study presentations to include one (1) paper from a DOST-FNRI Doctorate graduate. The titles of the technical sessions are as follows:

- Technical Session 1: Development and Innovation on Functional Food Products for Improved Health and Nutrition
- Technical Session 2: What's in your Food?
- Technical Session 3: Advancing food safety, food quality strategies, and innovative technologies to reduce malnutrition and food-borne illnesses
- Technical Session 4: Improving methods to assess health and nutrition
- Technical Session 5: R&D: Paving roads toward better health for women and children
- Technical Session 6: Combatting malnutrition and increasing immunity against infection

Two (2) special symposia on "A guide to a healthier you" and "An eye on iron" were also featured with representatives from the major sponsors of the FSS as speakers.

To further maximize the dissemination of scientific information and expand the participants' learning experience, the Institute's completed studies and the PhD graduate student dissertation were also showcased as electronic scientific poster presentations. All the e-scientific posters were made available for viewing during the two-day event. Authors of the different posters were within reach if and when inquiries on the posters were made by the participants. Also the final judging of the poster competition was held on July 5, 2023 by the selected board of judges as follows; Prof. James Roldan S. Reyes, Dr. Erica B. Tabuac, Ms. Maria Fatima Dolly R. Rearo, Dr. Katherine Ann Castillo-Israel, and Prof. Justin Godfred Peralta.

True to its commitment to knowledge by nurturing research culture among undergraduate students in Human Nutrition/Dietetics and Food Science/ Food Technology, a pre-event on the Undergraduate Student Research Competition (USRC) was held via zoom in June 23, 2023. The competition provided a platform for the students to communicate their research outputs to a broader audience. From a total of 16 entries from eight participating schools in the field

of food technology and 24 entries from 12 participating schools in the nutrition field, three (3) student finalists from each category emerged as winners. The board of judges were Dr. Mario V. Capanzana, Hon. Rhoda Joy Ramos-Buenviaje, Ms. Maria Lourdes A. Vega, Mr. Simoun Rainier L. Bayudan, Ms. Marianne Joy Gochangco-Laya, and Mr. Carlos Antonio M. Peña. The pre-event was attended by 78 participants composed of the university representatives, DOST-NCR and DOST-FNRI employees.

The Scientific Poster Competition and Undergraduate Student Research Competition was made possible through the unwavering financial support from the FSS' Gold sponsor, the DOST-National Capital Region (NCR).

Culminating the 2-day FSS event was the awarding of the winners for the electronic Scientific Poster Presentation and USRC held during the Closing Ceremonies on the second day of the 49th FSS, July 6, 2023.

The winners of the Undergraduate Student Research Competition were announced by Ms. Vannizsa I. Ramas, chair of the USRC Committee:

The winners are as follows:

Food Technology/Food Science Category

Award	Title of Research Entry	Authors	University
3rd Place	Effects of Skimmed Milk and Thickener on the Sensory and Physicochemical Characteristics of Cocoyam and Corn-based Analog Rice	Jomel S. Antolihao, Rujedin R. Olivar, Melanie D. Llamas, Bryan F. Lambo, Pet Anthony L. Pascual	Southern Leyte State University - Main Campus
2nd Place	Composition and Thermogravimetric Characterization of Philippine Tablea	Larrie Antoni B. Adaptar, Dr. Julius Andrew P. Nuñez, Dr. Aldrin Bonto, Dr. Maria Carmen Tan, Jasmin Ting, Richard Anthony Galian	University of the Philippines - Manila
1st Place	Evaluation of Starch Noodles prepared from Annealed Sweet Potato (I. batatas L.) Starch	Daniella Marie M. Arcega, Floirendo P. Flores, Ph.D.	University of the Philippines - Los Baños

Nutrition and Dietetics Category

Award	Title of Research Entry	Authors	University
3rd Place	Factors Influencing Complementary Feeding Practices of Mothers in Selected Barangays in Roxas City, Capiz	Rex Menard L. Cervales, Aria Jane P. Gonzales, Philina Ritzel L. Acob, Asst. Prof. Maria Carmela C. Taob	University of the Philippines - Diliman
2nd Place	Talaan: A Web-Based Dietary Assessment Tool in Assessing Dietary Intake	Cyril D. Religioso, Coleen C. Caparroso, Ian Frederick A. Romero, Loraine Anne M. Sagum, Marie Audrey A. Salazar, Diane Mendoza-Sarmiento, Florimae E. Paimalan	University of Santo Tomas

1st Place	Caring Connections Linking Knowledge, Dietary Fat Content, and Complementary Feeding Practices in Mothers of Children with Down Syndrome Aged 6 to 23 months	Selina D. Alforte, Hanazel B. Superal, Charlene Denise S. Esteban, Dr. Cecile Leah T. Bayaga	University of the Philippines - Diliman

For the Scientific Poster Competition, Ms. Hazel T. Lat, Chair of the committee announced the Outstanding Graduate Poster Award, top 10 consolation prizes, People's choice award, and finally the top three (3) winners from among the 51 poster entries.

The following projects and authors emerged as winners:

Award	Project Title	Authors
Outstanding Graduate Poster Award	Food Environment and Food Security during the COVID-19 Pandemic in Cavite Province, Philippines	Mildred O. Guirindola, Marissa J. Sobremisana, Enrique P. Pacardo, Corazon VC. Barba, Ma. Esmeralda C. Silva, Ruel B. Guirindola
Top 10/ Consolation Prize	Discover Safe Eats: The Food Safety Guideline for the Food Service Sectors	Trinidad II T. Arcangel, Vannizsa I. Ramas, Czarlyn April Joy G. Mendoza, John Lester G. Ramirez, Pamela Mildred G. Rosales, Milfred P. Paca-anas, Mario V. Capanzana, Rosemarie G. Garcia, Marcela C. Saises, Roxan Marie J. Francisco
Top 10/ Consolation Prize	Boost your Child's Nutrition with Coconut-Based Complementary Food	Alex M. Palomo, Vannizsa I. Ramas, Carissa T. Saldana, Charlie E. Adona, Ruben N. Panis, Filoteo D. Ponte, Robert G. Aduana, Johnellie S. Palafox
Top 10/ Consolation Prize	What is the Nutrition and Health Situation of the Filipinos in 2021?	Imelda Angeles-Agdeppa, Charmaine A. Duante, 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, 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, Chester G. Francisco
Top 10/ Consolation Prize	Awareness and Usage of Iodized Salt in the Philippines: Expanded National Nutrition Survey 2018-2019 and 2021	Mario V. Capanzana, Imelda Angeles-Agdeppa, Marina B. Vargas, Charina A. Javier, Glenda P. Azaña, Ma. Lilibeth P. Dasco, Charmaine A. Duante, Rosemarie J. Dumag, Dave P. Briones, Marites V. Alibayan, Cheder D. Sumangue
Top 10/ Consolation Prize	Pilot Scale Study of FNRI-Developed Iron Fortified Rice Blending Machine	Charlie E. Adona, Eugenio M. Ramirez, Jayson G. Tagaroma, Abbie L. Padrones, Francesca Louise P. Garcia, Ana Maximina C. Reyes, Jonahver O. Tarlit, Filoteo D. Ponte, Rex B. Castante

Top 10/ Consolation Prize	Iodine Status in Filipino Women: Pregnant, Lactating and at Reproductive Age	Mario V. Capanzana, Imelda Angeles-Agdeppa, Marina B. Vargas, 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, Cheder D. Sumangue
Top 10/ Consolation Prize	Shelf Life, Acceptability, and Retention of Red Palm Oil	Marcela C. Saises, Abbie L. Padrones, Aiza B. Umali, Bianca Drew Marie M. Espeño, Juniper B. Lala
Top 10/ Consolation Prize	Sociodemographic and Economic Factors Associated with Consumption of Fruits and Vegetables among Filipino Adults in 2018 and 2019	Josie Platon-Desnacido, Eva A. Goyena, Apple Joy D. Ducay, Chona F. Patalen
Top 10/ Consolation Prize	Undiagnosed Diabetes: The Silent Epidemic Factors Associated with High Fasting Blood Glucose among Filipino Adults not Diagnosed with Diabetes	Chona F. Patalen, Maria Stephani N. Parani, Apple Joy D.Ducay, Catherine M. Iranzo, Charmaine A. Duante
Top 10/ Consolation Prize	Stunted Filipino School-age Children have Poor Macro- & Micronutrient Intake	Maylene P. Cajucom, Frances Pola S. Arias, Apple Joy D. Ducay, Jamella Jeanne P. Victa
People's Choice Award	Boost your Child's Nutrition with Coconut-Based Complementary Food	Alex M. Palomo, Vannizsa I. Ramas, Carissa T. Saldana, Charlie E. Adona, Ruben N. Panis, Filoteo D. Ponte, Robert G. Aduana, Johnellie S. Palafox

3rd Place	SP-002	Move More for Healthier Filipino Teens	Marilou L. Madrid, Jason Paolo H. Labrador, Shaira G. Carandang, Noelle Lyn C. Santos, Hazel T. Lat, Lilian Jerina V. Galon, Nathan Michael L. Vasquez
2nd Place	SP-033	*Pagkain ni Baby, Wasto Ba?* Evaluating the 2021 Infant and Young Child Feeding Indicators in Relation to Dietary Adequacy and Anthropometric Status	Eva A. Goyena, Ma. Lynell V. Maniego, Antoniette G. Cristobal
1st Place	SP-031	*Dagdag Folic sa Harina, Dulot ay Pag-unlad at Sustansya:* Revisiting Food Fortification Act of 2000	Abbie L. Padrones, Richard L. Alcaraz, Maricar D. Albao, Junimer B. Lala

The 49th DOST-FNRI Seminar Series is another milestone achieved by the Institute. It is not just a tradition but a continuing commitment to disseminate and deliver science-based food and nutrition information for everyone. ■

Strengthen Industry-Academe, Government, and International STI Collaborations

2023 Contract Researches and Other Collaborative Projects on Food and Nutrition

Php 204,496,054.53

Contract Researches and Other Collaborative Projects on Food and Nutrition

Name of Business or Organization	Title	Project Duration		Responsible Person	Funds (Php)
		Start	End		
GOVERNMENT AGENCIES					
DOST-PCHRD	Relationship of Body Composition of the Functional Capacity and Quality of Life of Older Filipinos in Selected Provinces in the Philippines	March 2021	March 2023	RCTan, HLat	6,211,199.00
	Technology Generation for the Production of Fortified CocoDairy Milk Blend (Y2)	August 2021	December 2023	APadrones	3,158,382.56
	Bioequivalence of Virgin Coconut Oil among Healthy Filipino Male Adults: An Exploratory Pharmacokinetic Study	July 2022	June 2024	CVDCabanilla	4,961,043.00
	Linking the Metabolome with Genetic Variation, Nutrition, and Gut Microbiome: An Integrative Approach to Understand Child Growth and Development among the Selected Mother-Infant/Child Dyads of the Eastern Visayas Birth Cohort	August 2022	February 2027	JSNacis, JJSLLicayan	17,845,713.20

Name of Business or Organization	Title	Project Duration		Responsible Person	Funds (Php)
		Start	End		
	Identification of Genetic Variants Associated with Children's Growth and Development in a Filipino Birth Cohort	August 2022	August 2025	MSerafico	4,852,898.00
	Infant Gut Microbiota and Linear Growth: A Longitudinal Study of the Eastern Visayas Birth Cohort	August 2022	February 2027	DGADRonquillo	4,983,594.80
	Nutritional Status and Maternal Lifestyle among Pregnant Women in Samar and Biliran and its Relation to Pregnancy Outcomes during the First 1000 Days: A Prospective Cohort Study	August 2022	February 2027	RDFrane	13,498,425.20
DOST-PCHRD	Development and Pilot-scale Production of Innovative Food Products for Older Male and Female Filipinos	September 2022	August 2024	VRamas	8,571,246.72
	Managing Nutritional Needs of Older Filipino with due attention to Protein Nutrition and Functional Health (MANO PO) Study	September 2022	August 2024	RCATan, HTLat	11,459,614.36
	Evaluation of Nutrient Compositions, Potential Health-Promoting Properties and Harmful Components in Selected Edible Seaweeds in the Philippines	March 2023	March 2025	MESerafico	10,667,725.43

Name of Business or Organization	Title	Project Duration		Responsible Person	Funds (Php)
		Start	End		
	Development of Automated Diet Decoder and Recommender System Software (ADDReSS)	March 2023	March 2025	EAArnejo	5,924,000.00
	Data Visualization and Analytics for Innovation in Food and Nutrition-Development of Hunger and Malnutrition Heat Map, Phil. Version	May 2023	May 2025	DAguila	4,996,588.12
	Artificial Intelligence Nutrition Assistant (AINA) Project: Development and validation of a deep learning food recognition system for dietary assessment among Filipinos	May 2023	April 2023	NLC Santos	14,530,328.96
DOST-PCHRD	Development of Mobile Augmented Reality Food Models based on the Food Exchange List (MARFEL) as Nutrition Education Tool	May 2023	May 2025	SFArevalo	3,165,034.96
	Unification of e-Learning platforms of DOST-FNRI (U Learn)	May 2023	May 2025	DDeLeon	2,389,082.65
	Support for Paper Presentation Project: Energy Cost of Selected Physical Activities Among Community Dwelling Older Filipinos in Taguig City	July 2023	December 2023	HLat	93,621.80
	Nutrition and Healthy Aging Seminar Workshop: Setting the Nutrition Agenda for Healthy Aging and Dissemination of Results	August 2023	August 2024	RCTan	550,000.00

Name of Business or Organization	Title	Project Duration		Responsible Person	Funds (Php)
		Start	End		
DOST-PCHRD	Seroprevalence of Hepatitis B & C in the General Population in 2023: A Study Using the 2023 National Nutrition Survey	October 2023	September 2024	CPatalen	4,551,210.00
DOST-HRDP	Training on Disseminating Science & Technology Information Through Science Communication Approaches	January 2023	May 2023	NBristol	441,520.00
	Training on Pre-testing of Information, Education and Communication (IEC) Materials	January 2023	December 2023	IGlorioso	314,930.00
	Trainining on Pandemic Proof Projects (3Ps) Learning	January 2023	December 2023	IGlorioso	437,780.00
	Training workshop on the application of the Technology Needs Assessment (TNA) Protocol for the DOST Personnel	January 2023	August 2023	AOrtiz	800,000.00
DOST-NCR	Project on Supporting Adolescent Growth in the Philippines (Project SAGIP): A Pilot Study in Marikina City Phase 2	March 2022	Aug 2023	NLC Santos	1,266,726.23
	49th FNRI Seminar Series: Undergraduate Student Research and Scientific Poster Competitions	May 2023	September 2023	LAguilos	495,000.00
DOST-PCIEERD	Exposure Assessment of Chemical Contamination in Metro Manila: A Pilot Total Diet Study Approach (Year 3)	August 2021	July 2023	KNacionales	18,416,209.60

Name of Business or Organization	Title	Project Duration		Responsible Person	Funds (Php)
		Start	End		
DOST-National Research Council of the Philippines	A Policy Assessment: Nutrition Act of the Philippines Across Different Levels of Governance	November 2022	March 2024	IAngeles-Agdeppa, Ph.D. MBugas, Ph.D.	4,440.263.00
DOST	DOST-Smarter OneLab for Industry 4.0 Through Testing & Calibration Education	January 2023	December 2023	RDumag	30,569,955.00
DOH	Assessment of Selected Risk Factors of Non-Communicable Diseases	February 2023	February 2024	CPatalen	10,000,000.00
Department of Agriculture	Training on Microbiological Methods for Food Analysis	August 2023	August 2023	JGonzales	100,000.00
				TOTAL	**185,251,829.59**
INTERNATIONAL FUNDING AGENCY					
FAO, INMU	Determination of Energy Expenditure of Infants and Young Children (6-24 Months Old) in Asia Using Doubly-Labeled Water Technique	January 2019	December 2023	CVCabanilla	1,505,600.70
IAEA	Changes in Body Composition and its Effect on Childhood Cancer Survival Rates Among Newly Diagnosed Acute Lymphoblastic Leukemia Patients	January 2021	July 2025	MESerafico	696,393.00
UK MRC	Development and Potential Reversal of Type 2 Diabetes: How Critical is Vitamin A in the Regulation of Insulin Responsiveness and Lipid Homeostasis?	January 2022	March 2023	CVCabanilla	1,569,754.99

Name of Business or Organization	Title	Project Duration		Responsible Person	Funds (Php)
		Start	End		
ILSI Japan	Study on the challenges of commercializing multinutrient fortified rice in the Philippines	January 2023	June 2023	ALPadrones	548,300.00
	Study on the Challenge of Commercializing Malnutrient Fortified Rice in the Philippines	January 2023	December 2023	APadrones	548,300.00
Nestle	Societe Des Prduits Nestle S.A. for Trigem Project	January 2023	April 2025	IAngeles-Agdeppa, Ph.D	2,392,093.04
Abbott Manufacturing	Nutritional Adequacy in Filipino Adolescents and Factors Assosiciated with Height: Analysis of Data	January 2023	March 2024	MLManiego	1,584,477.50
Hellen Keller	Assessment of Vitamin A status among school children liiving in high-risk Areas in the Philippines	February 2023	May 2023	RDumag	598,600.00
IFPRI	FRESH Philippines: Suppport of Nutrition & Consumer Behavior Research & Cross Cutting Engagement Activities	April 2023	March 2024	IAngeles-Agdeppa, Ph.D	4,013,452.33
WHO	Development of the Front-of-Pack Labelling (FOPL) System for Promoting a Healthy Diet in the Philippines	May 2023	June 2024	CVCabanilla	1,717,439.76
	Development of the Front-of-Pack Labelling (FOPL) System in Promoting Healthy Diet in the Philippines	May 2023	June 2024	CVCabanilla	686,975.90

Name of Business or Organization	Title	Project Duration		Responsible Person	Funds (Php)
		Start	End		
USDA, BSAFE	Dietary exposure assessment of Filipinos to Aluminum from foods containing Aluminum Lake Colors Using the Theoretical Maximum Daily Intake Approach	September 2023	March 2024	REPGuilaran	859,470.99
IRRI	Determination of glycemic index of seven rice and rice products	December 2023	November 2025	AFPBaquiran	1,050,000.00
				TOTAL	**17,770,858.21**
PRIVATE INDUSTRY					
Pathogens for PHILME	Training on microbiological analysis of food pathogens for philmech	February 2023	February 2023	JGonzales	40,000.00
Wesleyan University	Illinois Wesleyan University (IWU) Interns: Training Fees	June 2023	July 2023	JGonzales	120,000.00
DOLE Philippines	Training on Microbiological Methods for Food Analysis and Quality Assurance in Microbiology Laboratories for DOLE Phils., Inc.	November 2023	November 2023	JGonzales	55,000.00
ISATU, SYSS INTL. INC., Golden Star Packaging, Petir Paul Phils., Pilmico	Training in Advanced Sensory Evaluation	November 2023	November 2023	JGonzales	78,000.00
				TOTAL	**293,000.00**
FOUNDATIONS					
New Pathways Incorporated	Development of a Technology for Iron Fortified Spiced Vinegar	November 2023	November 2024	ALPadrones	1,180,366.73
				TOTAL	**1,180,366.73**

Upgrade STI Facilities and Capacities to Improve S&T Services

Maintaining Integrity in Food and Nutrition R&D through Responsible Conduct of Researches Involving Human Participants

From right to left: Dr. Desiree R. Daniega (Chair); Dr. Paulyn Jean A. Claro (Co-chair); Marilita A. Aguilos (Member-Secretary); Members - Divorah V. Aguila; Dr. Marie Joy B. Arguillas; Dr. Soledad Natalia M. Dalisay; Dr. Rodolfo F. Florentino; Dr. Rodolfo E. Sumayao; Rev. Fr. Leonardo E. Dollentas; Redentor L. De Silva; and Martha A. Hernandez (Secretary)

The DOST-FNRI through the FNRI Institutional Ethics Review Committee (FIERC) ensures the responsible conduct of research involving human participants. The committee is committed to assess the scientific integrity of protocols, its consideration and respect for human participants' rights, welfare and well-being.

For 2023, a total of 41 protocols were accepted and screened for ethical clearance and 50 protocols were periodically reviewed and monitored to ensure compliance of the principal investigators to ethical principles.

Of the 41 protocols received, 10 underwent full review and 15 were for expedited review. The remaining 16 were exempted from ethical clearance since the studies utilized anonymized secondary and publicly available data. Initial review of

protocols and reporting of progress of on-going projects were done in seven (7) full board meetings conducted by the FIERC in 2023.

As a continuing commitment of the DOST-FNRI Management's support to the activities of the FIERC, funds for capacity building were provided. As such, FIERC members attended the following trainings and conferences to further enhance their knowledge and expertise in reviewing protocols:

- Feedback: REC Consultation Meeting on PHREB Accreditation Requirements, February 24, 2023
- Standard Operating Procedures for Review Ethics Committee, June 19-21, 2023
- 9th General Assembly of the Philippine Health Research Ethics Network, October 6, 2023
- Advanced GCP and Ethics Training, October 16-18, 2023.
- Online accreditation training of Asian Hospital and Medical Center, November 20-24, 2023

To provide better service, 11 DOST-FNRI project leaders who applied for ethical clearance for their protocols responded to the client satisfaction feedback survey conducted by the FIERC Secretariat. The service rendered from protocol submission to issuance of ethical approval attained a very satisfactory rating in terms of quality and promptness of service, courtesy of the Secretariat and over-all experience, with an average rating of 4.5 points. The comments and recommendations provided by the FIERC members were found to be reasonable and attainable and helped improve the project leaders understanding of ethical principles. It also increased their confidence in conducting the study knowing that human participants and data as well as the principal investigators are protected during the conduct of the research.

The commitment of the FIERC and DOST-FNRI to maintain integrity in food and nutrition R&D researches is an affirmation of the Institute's compliance in the responsible conduct of research. Given the meager budget for research and development, careful examination of the technical and ethical merits of projects will result to ethically-sensible protocols and make wise use of government fund/ resources. ■

Mainstreaming Gender and Development (GAD) Concerns in the Institute: A Continuing Commitment of the DOST-FNRI Gender Focal Point System (GFPS)

In its continuing commitment to be the drivers in mainstreaming GAD concerns at the DOST-FNRI, the DOST-FNRI and the GFPS undertook several programs, activities and projects in 2023 in support of GAD as follows:

Client-focused Activities:

- *2023 National Nutrition Survey (NNS)*: The 2023 NNS having been recognized as a project attributable to GAD obtained a score of 13.08 under the Project Implementation and Management, and Monitoring and Evaluation or PIMME. The score meant that the 2023 NNS is GAD-sensitive 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. More efforts to incorporate more GAD-related concerns in the NNS, though, still have to made to raise the bar for 2023 NNS to be more gender-responsive.

- *Project Results to Policy Recommendations: (PR to PR)*. Eight (8) policy statements addressing the nutritional needs of women and men across the different life stages were developed, the titles of which are as follows: 1. A Model Delivery System of Complementary Feeding and Nutrition Education; 2. BunTeens in CALABARZON ; 3. School-age children of OFWs: Were they food secure during the pandemic?; 4. Dapat laging handa sa anumang sakuna, unahin sina baby, nanay, lolo at lola; 5. Double and Triple Burdens of Malnutrition among Mother-Child Pairs; 6. Fortified Biscuits: An Aid to Dietary Supplementation 7. Be Active to

Stay Active: Physical Activity for Senior Matters; and 8. The Adolescence Stage as 2nd Window of Opportunity.

- *Marketing of DOST-FNRI Products and Services (MaPS):* The MaPs project disseminated 60 information, education and communication (IEC) materials concerning women, adolescent girls, and children. These were in the form of books, videos, board games, calendars, media releases and scientific write-ups.

- *Technology Transfer and Commercialization of DOST-FNRI Technologies/Products and Services:* 24 out of 85 (27%) technology adopters 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.

Organization-focused activities:

- *2023 National Women's Month Celebration (NWMC):* The DOST-FNRI GFPS staged "Serbisyo para kay Mama" through the promotion of the DOST-FNRI Lactation Facility. Through the DOST-GFPS office, a DOST-wide memorandum was issued encouraging lactating mother employees to use the facility, free of charge. As a result of this promotion, one of the DOST agencies, the Metals Industry Research and Development Center (MIRDC) sought the Institute's assistance in establishing its own lactation facility. Also, during the DOST-wide NWMC, licensed nutritionists-dietitians from the Institute offered nutrition counselling services to 19 female and 5 male employees of DOST.

- *DOST-FNRI Lactation Facility:* The operation and maintenance of the Lactation facility by the Lifestage Nutrition Section (LNS) provided two (2) DOST-FNRI employees the opportunity to express breastmilk during breastfeeding breaks.

- *GAD-related seminars:* A seminar on Intimate Partner Violence was held in December 7, 2023 via zoom. This webinar is also DOST-FNRI's contribution in the observance of the 18-day campaign to end violence against women (VAW). The resource person was Dr. Nathalie Africa-Verceles of the Department of Women and Development Studies, University of the Philippines, Diliman, Quezon City. 77 female and 15 male employees participated in the webinar.

- *18-day campaign to end VAW:* In addition to the webinar, DOST-FNRI participated in the DOST-wide contest on Orange your icon. A certificate of participation was awarded to the Institute in December 11, 2023.

- *GAD Capacity Development (CapDev) Activities:* The GFPS TWG chairperson and co-chairperson and members participated in the following CapDev activities: 1) Magna Carta on Women (MCW) Anniversary and GADtimpala Awarding, August 14, 2023, SM Aura; 2) DOST GAD Focal Point Assembly, Cauayan, Isabela City in October 18-10, 2023;

- *Updating of GAD Corner:* News updates, pictures and banners of support of GAD activities are posted in the GAD corner in the DOST-FNRI Website. ■

Science Soars: DOST-FNRI Takes Flight with Quality Efforts

The DOST-FNRI ISO 9001:2015 Quality Management System (QMS) Team convened virtually on September 15, 2023, to discuss and celebrate their accomplishments throughout the previous quarters.

As a leader in food and nutrition research, the Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI) strives its best to sustain its ISO 9001:2015 accreditation to deliver reliable results that will benefit the Filipino people.

The Institute confidently embraces diverse strategies, skillfully weaving together ideas to create flavorful and nutritious meals. Every plate is a vibrant blend of taste and health, with flavors dancing in harmony and nutrition taking center stage. The key to success lies in a well-organized system built on the globally accepted ISO 9001:2015 standards, spearheaded by Project Leader Jester C. Viriña. This standardized system under the project titled, "*DOST-FNRI Onward: Gearing towards Performance Excellence through PQA Performance Excellence Framework Adoption and ISO 9001:2015 Sustainability*", was meticulously crafted like a formula that guides the Institute's approach to every menu item. It ensures that each stage of the research and development process is efficient, effective, and ultimately, customer-centric.

This robust approach goes beyond the initial recipe creation. A thorough internal auditing procedure serves as a vital component of the Institute's quality management system (QMS). Like food safety inspectors, the dedicated internal auditors thoroughly examined every element of the Institute's operations. They perform regular audits to ensure that all departments adhere to the QMS recipe. To further empower them, a demo on Quality Management Information System (QMIS) was conducted on January 9 for internal auditors, which provided them with the tools and skills needed to perform more thorough audits. This, in turn, allows the Institute to identify areas for improvement and maintain the highest research standards.

Meanwhile, the internal audit opening meeting which was conducted on January 16, 2023 set the stage for a comprehensive audit process. During the internal audit proper, each division was thoroughly assessed to identify opportunities for improvement and demonstrate their commitment to quality. These efforts culminated in the closing meeting on February 23, 2023 during which the findings were discussed and action plans were established to address the identified gaps. The Management Review, held on March 6, 2023 reinforced the Institute's commitment for continuous improvement. It is comparable to a chef's table, where they assess the success of the QMS and brainstorm ideas to enhance it. This continuing engagement keeps them innovative and ensures that the Institute is constantly refining its research methodology.

A significant milestone was achieved during the 2nd Surveillance Audit held on March 10th. This external audit re-

validated the Institute's compliance to ISO 9001:2015 standards, providing an objective assessment of its QMS. The favorable outcome of this audit demonstrates its continued efforts to maintain and exceed quality standards - an official stamp of approval for the Institute's dedication to innovation and excellence. This relentless pursuit of improvement is key to achieving success. Regular ISO meetings, PQA meetings, and QMS team meetings facilitated ongoing dialogue and cooperation. These collaborative sessions were complemented by specialized training programs, such as ISO 9001:2015 QMS awareness, effective management of corrective action, auditing techniques enhancement, and QMR training, which equipped its employees with the knowledge and skills needed to uphold its quality standards.

While the Institute juggles numerous goals, understanding its customers remains the top priority. To achieve this, the Customer Online Feedback System (COFF) is a game-changer that provides a clear picture of customer satisfaction and areas for improvement. Furthermore, the Institute's commitment extends beyond data collection – regular meetings guarantee that customer voices are heard and swiftly translated into action.

DOST-FNRI's ISO 9001:2015 certification is more than just a feather in the cap; it signifies the Institute's unwavering commitment to quality, efficiency, and exceeding customer expectations. The Institute remains committed to its mission for continuous improvement and innovation, keeping its position at the forefront of excellence in food and nutrition research. Future initiatives include expanding its digital infrastructure, strengthening stakeholder engagement, and adopting game-changing technologies to tackle emerging challenges in food and nutrition. ■

Summary of Activities

TASKS	COMPLETION DATE	NOTES
Internal Audit	January 18-30, 2023	Effectively carried out by qualified and competent internal auditors, leading to the identification and closure of 39 OFIs and 4 NCs.
Management Review	March 6, 2023	The team actively engaged in productive discussion to harness the Institute's strengths, address its weaknesses, and seize opportunities for more advancements.
2nd Surveillance Audit (TUV Rheinland)	March 10, 2023	Spearheaded by proficient external auditors, namely Maribeth Lucañas, Lynn Gerzon, Grace Del Rosario, and Madilyn Plaza, resulting in the identification and closure of 23 OFIs and no NC.
Customer Online Feedback System (COFF)	October 1, 2023	Implemented remote access for the COFF and unlocked its enhanced features for greater flexibility and efficiency.
ISO Trainings	• QMIS demo with IA (9-Jan) • ISO 9001:2015 QMS Awareness (29-Jun) • Effective Management of Corrective Action (14-Sep) • QMR Skills Development (13&14-Nov) • Auditing Techniques Enhancement (18-Dec)	Implemented remote access for the COFF and unlocked its enhanced features for greater flexibility and efficiency.
ISO Meetings	• 4 QMS (30-Mar, 30-Jun, 15-Sep, 15-Dec) • 1 Management Review (6-Mar) • 2 ROMC (12-May, 22-Nov) • 2 COFF (13-Sep, 19-Sep)	Successfully conducted nine meetings/ sessions to ensure that all team members are well-versed on current quality practices and standards.

ON-THE-JOB TRAININGS

18

On-the-job trainees

School	Number	Field	Duration
LOCAL			
Taguig City University	1	Bachelor of Science in Computer Science	February 2 - May 25, 2023
Samar State University	1	BS Information Technology	March 20-July 14, 2023
Taguig City University	1	Bachelor of Science in Computer Science	March 22 - August 4, 2023
Taguig City University	1	Bachelor of Science in Computer Science	March 30 - July 14, 2023
Arellano University - Andres Bonifacio Campus	1	BA Psychology	April 19 - May 23, 2023
Central Luzon State University	4	Bachelor of Science in Food Technology	June 26 - August 18, 2023
Technological University of the Philippines	1	Bachelor of Applied Science in Laboratory Technology	July 21 - August 24, 2023
Polytechnic University of the Philippines, Sta. Mesa	2	Bachelor of Science in Nutrition and Dietetics	August 17 - September 29, 2023
INTERNATIONAL			
Illinois Wesleyan University	6	Kinesiology & Allied Health, Nursing, Environmental Studies, Philosophy & Psychology	June 7 - July 27, 2023

IN-HOUSE TRAINING ORGANIZED AND ATTENDED BY DOST-FNRI STAFF

59
In-house trainings

Title	Date	Venue	No. of Participants
Introduction to Food Systems Work in the Philippines	January 18, 2023	Online via Zoom	49
Orientation on CSC Prime-HRM Pillars	January 23, 2023	DOST-FNRI	30
PRIME-HRM Orientation	January 23, 2023	Online via Zoom	130
HRM-Prime Seminar Training	Jan 23, 2023 and Feb 15, 2023	FNRI Auditorium	14
Orientation on CSC Prime-HRM Pillars	February 15, 2023	DOST-FNRI	18
HRM PRIME	February 16, 2023	DOST-FNRI Auditorium	130
Echo Seminar: Taking your Team from Good to Great: Essentials of a High-Performance Team	March 1, 2023	Online via Zoom	86
Speakers' Bureau and Writers' Pool Seminar-Workshop	March 7, 2023	DOST-Admatel	40
Gut Microbiome Training Workshop	March 13-16, 2023	DOST-FNRI NuGen Lab Conference Room and Information Resource Station	14
Household Food Security for Nutrition Well-being	March 21, 2023	Online via Zoom	33
NUTRINET orientation for DA-NFRDI	March 27, 2024	Online via Zoom	8
Basic Concepts of KOBO	March 30, 2023	Online via Zoom	26
Workshop on Literature Search for NGF Revision	April 3, 2024	NFRDD Meeting Room	15
FIRSt Virtual Space: Publishing in Journals for Beginners	April 13, 2023	DOST-FNRI	60
Training on Pandemic Proof Projects (3P's) Learning	April 18-20, 2023	Eurotel Makati Hotel	53

Title	Date	Venue	No. of Participants
DOST-FNRI's NAMD Thursdate 'Keeping Each Other Safe: The Use of Psychological First Aid to Promote Mental Health'	May 11, 2023	Online via Zoom	18
Training-Workshop on Proficiency Testing: ISO/IEC 17043:2010 and ISO 13528:2022	May 15-16, 2023	DOST-FNRI Conference Room	12
Webinar on Non-Nutritive Sweeteners and Precocious Puberty	May 8, 2023	Online via Zoom	11
FNRI Thursdate with NAMD: Keeping Each other safe: The Use of Psychological First Aid to Promote Mental Health	May 11, 2023	Online via Zoom	4
Training on Disseminating S&T Information through Science Communication Approaches	May 16-18, 2023	Manila Grand Opera Hotel	50
F&N Talks Ep. 5: DOST-FNRI Coco-based Functional Foods & (LH)2 Drying System	May 30, 2023	Online via Zoom	201
Training-Workshop on Qualitative Research: Design, Analysis, and Interpretation	June 6-7, 2023	Acacia Hotel, Alabang, Muntinlupa City	14
Tackling Nutritional Challenges of the 21st Century: How Nuclear Techniques Help	June 8, 2023	Online via Zoom	81
Value Based Time Management	June 9, 2023	DOST-FNRI Information Resource Station	25
Drug Abuse Prevention in the Workplace	June 14, 2023	Online via Zoom	202
Leave Administration Course for Effectiveness	June 29, 2023	Online via Zoom	46
ISO 9001:2015 Awareness Seminar	June 29, 2023	Online via Zoom	20
It's all about the Hurricane	July 3, 2023	Online via Zoom	28
Pilot Philippine Total Diet Study Writeshop	July 10-14 2023	Acacia Hotel Manila, Alabang, Muntinlupa City	20
Workshop with the 17 DOH-National Nutrition Council (NNC) Regional Nutrition Program Coordinators (RNPCs)/ Representatives on the Policy Assessment project	July 13, 2023	NNC Boardroom, NNC Building, Taguig City	38

Title	Date	Venue	No. of Participants
NFRDD Echo Webinar on IAEA-Assisted Training Activities	July 13, 2023	Online via Zoom	51
Juneteenth and its Food Tradition	July 13, 2023	Online via Zoom	28
Republic Act no. 9184 and Its Revised Implementing Rules and Regulations	July 25-28, 2023	Online via Zoom	46
Nutrition and Gaming	July 26, 2023	Online via Zoom	28
Installation and Operation of Telstar Biological Safety Cabinet BIO II ADV PLUS 4	July 28, 2023	DOST-FNRI	13
Packaged Food, Packaged Life	July 31, 2023	DOST-FNRI Information Resource Station	26
Training on Pretesting of Information Education and Communication	August 2-4, 2023	Selah Pods Hotel, Pasay City	47
Responsible Conduct of Research	August 2,3 & 7, 2023	DOST-FNRI Online via Zoom	3
In-house Training on "Enhancing Proficiency in Nutritional Assessment Techniques"	August 18, 2023	NRU Meeting Room, DOST-FNRI	7
Thermo Scientific Applied Biosystems SimpliAmp Thermal Cycler Training for Operations	August 22, 2023	DOST-FNRI	10
Training-Workshop on Method Validation and Verification	August 23, 2023	NRU Meeting Room, DOST-FNRI	4
Training on the use of Clinical Analyzer	August 30, 31, & September 18, 2023	DOST-FNRI	3
Celebration of Senses: How to be a Sensory Panelist	August 31, 2023	Online via Zoom	7
Effective Management of Corrective Action	September 14, 2023	Online via Zoom	55
Ugat? Baka Takway Yan!	September 15, 2023	Online via Zoom	25
AI: Crafting User-Friendly Web Magic	September 18, 2023	Online via Zoom	25
Strategic Team Planning	September 19, 2023	Online via Zoom	26
GC Isolink and EA Isolink IRMS System Overview (16 hrs)	October 10-11, 2023	DOST-FNRI	33

Title	Date	Venue	No. of Participants
Inception Workshop and Signing Ceremony with B-SAFE Team and DOH-FDA	October 13, 2023	DOST-FNRI Conference Room	22
2023 Planning Officers' conference cum L&D	Oct. 26, 2023	DOST-FNRI	3
Exceptional Customer Service: Nurturing a Customer-Driven Mindset, Habits and Heart for a fulfilling Work Environment	November 16, 2023	Online via Zoom	43
IRMS Hands-On Training	November 21-23, 2023	DOST-FNRI IRMS Laboratory	7
Work Attitude and Values Enhancement	November 23, 2023	Online via Zoom	59
Effective Methods and Enabling Policy of Managing Records Disposition Program in Government Office	November 29, 2023	Online via Zoom	14
Intimate Partner Violence Webinar	December 7, 2023	DOST-FNRI	11
Accounting Policies, Guidelines and Procedures for National Government Agencies	December 7, 2023	Online via Zoom	29
Gel Electrophoresis and UV Transilluminator Training	December 13, 2023	DOST-FNRI	12
Echo on Life Cycle Analysis and Scientific Writing	December 14, 2023	DOST-FNRI Information Resource Station	24
Auditing Techniques Enhancement	December 18, 2023	Online via Zoom	13

2023 Scientific Linkages and International Cooperation

11

Scientific Linkages and International Cooperation

10

Scientific Linkages and Local Cooperation

INTERNATIONAL

Institution/Agency	Project
Duke University	Project on Supporting Adolescent Growth in the Philippines (SAGIP): A Pilot Study in Marikina City Phase 2
Institute of Nutrition, Mahidol University	"Determination of Energy Expenditure of Infants and Young Children (6-24 months old) in Asia using the Doubly-Labelled Water (DLW) Technique"
Instituto Nacional De Saúde Doutor Ricardo Jorge (National Institute of Health Doutor Ricardo Jorge)	Research Consultants (Workshop/Writeshop) - Pilot Philippine Total Diet Study
International Atomic Energy Agency	National Technical Cooperation (TC) Project PHI6027: "Establishing the Association between Environmental Enteric Dysfunction and Linear Growth and Nutritional Status in Filipino Children Below Five Years Old"
	Regional TC Project RAS6103: "Applying Stable Isotope Techniques to Assess Protein Quality of Sustainable Food Sources for the Improvement of Maternal and Child Nutrition"
	Coordinate Research Project E43033: "Changes in Body Composition and its Effect on Childhood Cancer Survival Rates Among Newly Diagnosed Acute Lymphoblastic Leukemia Patients"
	Regional TC Project RAS6092: "Using Stable Isotope Techniques to Monitor Situations and Interventions for Promoting Infant and Young Child Nutrition - Phase II"

Institution/Agency	Project
International Life Sciences Institute	Study on the challenges of commercializing multinutrient fortified rice in the Philippines
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?
New Pathways Incorporated	Development of a technology for iron fortified spiced vinegar
Newcastle University	Development and potential reversal of Type 2 Diabetes: How critical is vitamin A in the regulation of insulin responsiveness and lipid homeostasis?
United States Department of Agriculture (USDA)	Dietary Exposure Assessment of Filipinos to Aluminum From Foods Containing Aluminum Lake COlors Using the Theoretical Maximum Daily Intake (TMDI) Approach
University of Toronto / The Hospital for Sick Children (SickKids)	Regional TC Project RAS6103: "Applying Stable Isotope Techniques to Assess Protein Quality of Sustainable Food Sources for the Improvement of Maternal and Child Nutrition"
Wageningen University and Research	NutriMetabolomics Investigation of Malnutrition in the Philippines: Phase 1
	The Eastern Visayas Birth Cohort Program
	Nutrimetabolomics investigation of Malnutrition in the Philippines: A Component Study of the Expanded National Nutrition Survey Phase I: Dietary Intake, Genetic Polymorphisms, and Urine Metabolomics: A Discovery Study on Sugar-Sweetened Beverages (SSBs) and Obesity among the Adolescent Participants of the 2021 Expanded National Nutrition Survey
	Research Consultants (Workshop/Writeshop) - Pilot Philippine Total Diet Study

LOCAL

Institution/Agency	Project
Biliran Provincial Hospital	The Eastern Visayas Birth Cohort Program

Institution/Agency	Project
Biliran Province State University	The Eastern Visayas Birth Cohort Program
Department of Health - Food and Drug Administration	Dietary Exposure Assessment of Filipinos to Aluminum From Foods Containing Aluminum Lake Colors Using the Theoretical Maximum Daily Intake (TMDI) Approach
Philippine Statistics Authority	Research Collaborator
	Research Data Source
Palawan State University	Seaweeds Program - Collaborative Research
Philippine Genome Center	Identification of Nutritional Disorder-Related Genes among Respondents of the Expanded National Nutrition Survey (INDEX): Year 3 Identification of Genes Associated with Non-communicable Diseases (Hypertension, diabetes, cancer and obesity)
Samar Provincial Hospital	The Eastern Visayas Birth Cohort Program
Samar State University	The Eastern Visayas Birth Cohort Program
University of the Philippines - Diliman	The Eastern Visayas Birth Cohort Program
Winrock International	Dietary Exposure Assessment of Filipinos to Aluminum From Foods Containing Aluminum Lake Colors Using the Theoretical Maximum Daily Intake (TMDI) Approach

Scientific Papers Published

25

Scientific Papers Published

Title	Authors	Journal	Date Published
The Interindividual Variability of Phytofluene Bioavailability is Associated with a Combination of Single Nucleotide Polymorphisms	MPZumaraga, PBorel, RBott, MNowicki, DLairon, CDesmarchelier	Molecular Nutrition and Food Research	January 2023
Lipote fruit anthocyanin-rich extracts as food colourants: extraction optimization and stability of natural and copigmented anthocyanins	RRodriguez	Food Research	February 2023
Comparing two simplified questionnaire-based methods with 24-h recalls for estimating fortifiable wheat flour and oil consumption in Mandaluyong City, Philippines	CVCabanilla, VFriesen, JMiller, RBitantes, MFRearIo, CArnold, MMbuya, LNeufeld, FWieringa, AStormer, MCapanzana, GLietz, MHaskell, REngle-Stone	Maternal & Child Nutrition	February 2023
Unmasking the Real Effect of Gender of Household Head in Household Food Security in the Philippines	MOGuirindola, CGCustodio Jr., JDVillanueva, RBGuirindola	Philippine Journal of Science	February 2023
Development of Phil-HEI and its evaluation of the Filipino diet: 2018 Expanded National Nutrition Survey	IAngeles-Agdeppa, Ph.D., MBToledo, JMSDariagan, JATZamora	NFS Journal	February 2023
Validity of Body Roundness Index to Screen Abnormal Blood Lipid among Filipino Adults	JCRMorillo, ERBullecer, CFPatalen	Philippine Journal of Science	February 2023
Prevalence and Factors Associated with Hypertension among Filipino Adults in Different Survey Periods	CFPatalen, MSNParani, AJDDucay, KDAInso, AGCristobal, MLPDasco, CADuante	Philippine Journal of Science	February 2023
Estimation of Free Sugars in the Filipino Food Composition Table and Evaluation of Population-Level Intake	FMainardi, VCCampos, RGCote, NKSilber, RPlestina, IAngeles-Agdeppa, Ph.D.	Nutrients	March 2023

Title	Authors	Journal	Date Published
Validity and reliability of online questionnaire on awareness, knowledge, attitude and self-efficacy (AKAS) on healthy eating for nutrition education and promotion	MSGonzales, Ph.D., IGGlorioso, CAJNavarro, TKBJolejole	Malaysian Journal of Nutrition	April 2023
Government-Industry-Academia Alliance: A multi-sectoral collaboration for improved nutrition of children and well-being of mothers	DVAguila, JBDorado, MVCapanzana, Ph.D.	Malaysian Journal of Nutrition	April 2023
Nutrition in Times of Crisis: A Qualitative Study in Siargao Island, Philippines, during the COVID-19 Pandemic	GLasco, VG Yu, JMCompra, PLeuangvilay, RSuphanchaimat, YZhang, CAJavier	Acta Medica Philippina	May 2023
Determinants of Underweight and Stunting among 6–59-months-old Indigenous Children in the Philippines	RViajar, JDorado, MLManiego, JJGulay, PlAmita, lAngeles-Agdeppa, Ph.D.	Philippine Journal of Science	June 2023
Volatiles fingerprinting of aromatic rice cultivars for varietal discrimination using gas chromatography-flame ionization detector	MSerafico, FSevillalll	Philippine Journal of Science	August 2023
Dietary Exposure of Filipinos to Ochratoxin A and Glyphosate from Commonly-Consumed Foods using Theoretical Maximum Daily Intake (TMDI) Approach	RApilado, REGuilaran, RATeodoro, EBilledo	Journal of Chemical Health Risks	August 2023
A study protocol for a pilot randomized controlled trial to evaluate the effectiveness of a gene-based nutrition and lifestyle recommendation for weight management among adults:the MyGeneMyDiet study	JNacis, DGRonquillo, MMadrid, JPLabrador, NLSantos, RFrane	Frontiers in Nutrition	August 2023
A comparative analysis of the cost-utility of the Philippine tax on sweetened beverages as proposed and as implemented.	OHuse, KBackholer, PNguyen, ACalibo, MGuirindola, JDesnacido, GSacks, ACBell, APeeters, lAngeles-Agdeppa, Ph.D., JAnanthapavana	The Lancet Regional Health – Western Pacific	September 2023
Snacking patterns of Filipino children: Frequency and contribution to energy and dietary intakes	MSerafico, EGoyena, Ph.D., JDesnacido, AJDucay	Philippine Journal of Science	October 2023

Title	Authors	Journal	Date Published
Considerations for modelling a broad food tax in the Philippines and other low-income and middle-income countries	EGoyena, Ph.D.	BMJ Global Health	October 2023
Monitoring the Consumption of Sugar-Sweetened Beverages: An Input to Republic Act No. 10963 (Train Law)	MLDasco, JDesnacido, AJDucay, CDuante, M Vargas	Philippine Journal of Science	October 2023
Snacking Patterns of Filipino Children: Frequency and Contribution to Energy and Dietary Intakes	MSerafico, EGoyena, JDesnacido, AJDucay	Philippine Journal of Science	October 2023
Food and Nutrient Consumption Patterns of Filipino Pregnant and Lactating Women Based on a Nationwide Survey	EGoyena, Ph.D., JPlaton-Desnacido, DTabud, AJDucay	Philippine Journal of Science	October 2023
Chemometric differentiation of aromatic rice cultivars using gas-phase Fourier transform infrared spectroscopy	MSerafico, FSevillaIII	Acta Manilana	November 2023
Global variation in diabetes diagnosis and prevalence based on fasting glucose and hemoglobin A1c	NCD Risk-factor Collaboration (NCD-RisC)	Nature Medicine	November 2023
Will Food Be Affordable to Filipinos by 2030? Alternative Expenditure Policies toward Ending Hunger by 2030	RBriones, IAngeles-Agdeppa, IEspineli, B., HBouis. MLManiego	2023 Discussion Papers of the Philippine Institute for Development Studies	December 2023
Validation of selected 2021 infant and young child feeding indicators for appropriate complementary feeding in relation to dietary adequacy and anthropometric status	EGoyena, Ph.D., MLManiego, ACristobal	Malaysian Journal of Nutrition	December 2023

Scientific Papers Presented

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Scientific Papers Presented

INTERNATIONAL

Title of Paper	Author/Presenter	Place/Venue/ Conference	Date Presented
Food Environment and Food Security during the COVID-19 pandemic in Cavite Province Phillippines	MGuirindola, Ph.D.	Sheraton Hanoi Hotel, Hanoi Vietnam/4th Global Conference of the One Planet Network 's Sustainable Food Systems Programme: the Transformation we need	April 26, 2023
Development of Spiked Rice Flour Reference Material through Interlaboratory Comparison	LDajay, JCotara, MGuerra, JLaurea, MMartin, MGParcarey, and PAdona, Jr.	International Workshop on Laboratory Quality Standards Towards Global Competitiveness, Acacia Hotel, Alabang, Muntinlupa City	May 24, 2023
Validation of Microwave-Assisted Hydrolysis, Derivatizationwith Phenylisothiocyanate, and High-Performance LiquidChromatography with Ultraviolet Detection for theDetermination of Amino Acids in Selected Foods	KNacionales, RTanaka, ALDavid, MTSoriano, MSBaylosis, ALundag, and lLundag	International Workshop on Laboratory Quality Standards Towards Global Competitiveness, Acacia Hotel, Alabang, Muntinlupa City	May 24, 2023
Chemical Proficiency Assessment of Laboratories in the Asia Pacific for the Analysis of Nutrition Labeling Parameters of Corn-Based Snack Food and Fortified Rice-Monggo Blend	LDajay, JCotara, JLaurea, MGuerra, MMartin, MGParcarey, and PAdona, Jr.	International Workshop on Laboratory Quality Standards Towards Global Competitiveness, Acacia Hotel, Alabang, Muntinlupa City	May 25, 2023
Maternal Stunting and Other Determinants as Drivers of Childhood Stunting in the Philippines	MGuirindola, Ph.D.	International Online Nutrition Seminar 2023 of Health Polytechnic Semarang, Indonesia	September 16, 2023

Title of Paper	Author/Presenter	Place/Venue/ Conference	Date Presented
Food and Nutrient Consumption Patterns of Filipino Pregnant and Lactating Women Based on a Nationwide Survey	EGoyena, PhD., JDesnacido, AJDucay	Micronutrient Forum 6th Global Conference The Hague, Netherlands	October 16-17, 2023
Making Foods Available, Affordable and Accessible during Food Shocks: A case of a Peri-Urban Province of Cavite Philippines	MGuirindola, Ph.D.	Micronutrient Forum 6th Global Conference The Hague, Netherlands	October 16-17, 2023
The Food Aid Program in the Philippines during the COVID-19 Pandemic and the Recommended Ways Forward	MGuirindola, Ph.D.	Micronutrient Forum 6th Global Conference The Hague, Netherlands	October 16-17, 2023
Who are more likely to go hungry? Factors Affecting Household Food Security in CALABARZON, Philippines	MBDecena	International Conference on Applied and Agricultural Economics	October 19, 2023
Prevalence and factors associated with Intra-individual Double Burden of Malnutrition among Filipino Women of Reproductive Age	MSParani, CPatalen, CSumangue, CDuante, IAngeles-Agdeppa, Ph.D.	Seoul International Congress of Endocrinology and Metabolism. Seoul, South Korea	October 26-28, 2023
Waist-to-Height Ratio as an index of Central Adiposity among Filipino Adults	CPatalen, MS Parani, PIAmita, AJDucay, JJVicta, CDuante, IAngeles-Agdeppa, Ph.D.	Seoul International Congress of Endocrinology and Metabolism. Seoul, South Korea	October 26-28, 2023
Beyond the scales and blood draw: linking the genome and the metabolome to investigate malnutrition in the Philippines	JNacis	Katholieke Universiteit Leuven, Belgium	December 2023
La concentration en alpha-tocopherol (vitamin E) dans le tissu adipeux humain esx associee une combinaison de polymorphisms mononucleotidiques	MPZumaraga	Journées Francophones de Nutrition, Parc Chanot, Marseilles, France	December 2023

LOCAL

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
28th Joint Annual Convention of the Philippine Society of Hypertension & Philippine Lipid and Atherosclerosis Society Symposium 1 on BP Nomogram in Children	CFPatalen	Online Platform	February 15, 2023
Philippine Guidelines on Periodic Health Examination (PHEx) - Renal, Metabolic, Nutrition, and Endocrine Task Force En Banc Meeting on Evidence Summary for Malnutrition	CFPatalen	Online Platform	March 7, 2023
Virtual Feedback Meeting on "Nutritional Status, Dietary Intake and Care Practices of 6 Months to 5-Year-Old Children from Households with Temporary Labor Migrant Parents"	JJSGulay	Online Platform	March 30, 2023
FNRI's methodology in computing the per capita consumption of fish as reflected in the FNRI's food and nutrition survey	EAGoyena	DA-BFAR	April 14, 2023
Presentation of the Present State of Malnutrition in the Philippines	CADuante	PPAN's 2023-2028 Theory of Change Workshop	April 17, 2023
Virtual Feedback Meeting on "Nutritional Status, Dietary Intake and Health Seeking Practices of Teenage Pregnant Women in Selected Areas in CALABARZON"	EORongavillla	Online Platform	May 9, 2023
Selected Anthropometric Results from National Nutrition Survey	GMGironella	UPLB Institute of Statistics (INSTAT) / INSTAT 25th Anniversary Research Symposium	June 5, 2023

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
NNS Overview and Methodology	CADuante	Online Platform (NCIP staff and focal persons)	June 8, 2023
Development of Amino Acid Method for Generation of Philippine Food Composition Data	KNacionales, RTanaka, ALDavid, MTSoriano, MABaylosis, ALundag, ILundag	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5, 2023
Laboratory Performance Evaluation through Proficiency Testing in Corn-based Snack Food	LDajay, JCotara, JLaurea, MMartin, MGParcarey, and PAdona, Jr.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5, 2023
OPTIDIETS: Optimization of Low-Cost Nutritionally Adequate Diets for Filipinos Using a Web-based Analysis Tool	CVCabanilla	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5, 2023
Philippine Nutrient Profiling Model	MSerafico	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5, 2023
Pinggang Pinoy® Meals: How much minerals are available?	MLCumagun	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5, 2023

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
Production of Spiked Rice Flour Reference Materials for Chemical Analysis	LDajay, JCotara, MGuerra, JLaurea, MMartin, MGParcarey, and PAdona, Jr.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5, 2023
A Model Delivery System for Complementary Feeding and Nutrition Education in the Countryside	JDorado, RViajar, JJGulay, ERongavilla, NBuyco, GCaraig, MBugas, Ph.D. and MARRamirez	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Analysis of the Cost of One-Day Food Consumption of Households Meeting Requirements for Energy and Nutrients	MARRamirez, CJavier, and GGironella	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
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	MAJavier, CDuante, EGoyena, Ph.D., JDesnacido, MMagnaye Jr., KAKua, APApolinar, IAngeles-Agdeppa, Ph.D.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Awareness and usage of iodized salt in the Philippines: Expanded National Nutrition Survey 2018-2019 and 2021	MVCapanzana, Ph.D., IAngeles-Agdeppa, Ph.D., MBVargas, Ph.D.(†), CJavier, GPAzaña, RJDumag, DPBriones, MVAlibayan, and CDSumangue	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
Development of Nutrition Survey Data Warehouse System	MAJavier, CDuante, MLManiego, EFerrer, OJde Leon, IAngeles-Agdeppa, Ph.D	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Drivers in Anemia Reduction among Women of Reproductive Age: The Philippines Case Study	IAngeles-Agdeppa, Ph.D., AOwais, EAGoyena, ZABhuttah, KSamson, HAhsan, CMerritt, CLee, PRattan, MLVManiego, FPSArias, GPAzana, JPDesnacido, MPCajucom and A Ataullahjan	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Drivers of Food Insecurity in Rural and Urban Households in the Philippines: Findings from the 2018 ENNS	CAJavier, JAJPSy, JJPVicta, JPatricio, CADuante, and MLPDasco	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
eDCS Innovations: Streamlining the ENNS data collection process	MAJavier, CDuante, OJde Leon, CGonzales, AVeraña, RCBrosa, MMagnaye Jr, IAngeles-Agdeppa, Ph.D.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
Establishing Blood Pressure Norms for Filipino Children, 3 to 17 years old	CFPatalen, Dr. DDBonzon, Dr. CCSAcuin, CADuante, MLVManiego, MCdelos Santos, AGCristobal, MLPDasco and lAngeles-Agdeppa, Ph.D.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Evaluation of the 2021 Infant and Young Child Feeding Indicators in relation to Dietary Adequacy and Anthropometric Status	EAGoyena, MLVManiego, and AGCristobal	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Factors Associated with High Fasting Blood Glucose Among Filipino Adults Not Diagnosed with Diabetes	CFPatalen, MSNParani, AJDDucay, CMIranzo, and CADuante	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Food Environment as a Driver of Food Security during the COVID-19 Pandemic in Cavite Province, Philippines (Graduate Study Poster Presentation)	MGuirindola	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
Iodine status of Filipino women: Pregnant, Lactating and at Reproductive Age	MVCapanzana, Ph.D., IAngeles-Agdeppa, Ph.D., MBVargas, Ph.D.(†), GPAzaña, MESerafico, RJDumag, DPBriones, MVAlibayan, JRCUlanday and CDSumangue	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Local Nutrition Program Implementation and Other Factors Affecting Food Security and Nutritional Status: Case Study of Batanes and Aurora Province	CAJavier, JAJPSy, CDSumangue, and MLPDasco	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Malnutrition Reduction Program (MRP) Moving Forward Towards Sustained Implementation Project 2: Monitoring and Evaluation of MRP DOST PINOY	JBDorado, JJSGulay, EORongvailla, JTGonzales, RHPagaspas, RVViajar, CAJNavarro, GSCaraig, NGBuyco, FBBragas, CTSMartinez, MTBugas	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
OptiDiets: Optimization of Low-Cost, Nutritionally Adequate Diets for Filipinos Using A Software Analysis Tool	CVDCabanilla, RCATan, MLTCamagun, MADGironella, CAJavier, EABArnejo, CADuante, MLPDasco, ADSabenecio, MDDionela, Engr. RGGarcia, MESerafico and MVCapanzana, PhD.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
Pagkain ni Baby, Wasto ba?: Evaluating the 2021 IYCF Indicators in relation to Dietary Adequacy and Anthropometric Status	EAGoyena, MLVManiego, AGCristobal	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Predicting malnutrition among children under five years old with the use of classification techniques in Data Mining	MAJavier, CDuante, MLDasco, AJDucay, KAKua, RCBrosa, PJGerero and lAngeles-Agdeppa, Ph.D	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Predictors of Physical Inactivity among Filipino Adolescents: 2018-2019 ENNS	GPAzana, MLVManiego, JJPVicta, and MLPDasco	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Predictors of physical inactivity among Filipino adolsecents: 2018-2019 ENNS	GPAzaña, MLVManiego, JJPVicta and MLPDasco	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Protecting Health and Nutrition of Vulnerable Groups in emergencies	MARMRamirez, GSCaraig, and NGBuyco	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
Sociodemographic and Economic Factors Associated with Consumption of Fruits and Vegetables among Filipino Adults in 2018-2019	JPDesnacido, EAGoyena, AJDDucay, and CFPatalen	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Socioeconomic and Demographic Factors Associated with Fruits and Vegetable Consumption	JDesnacido, EGoyena, Ph.D., CPatalen, AJDucay	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
The Philippines: A Global Exemplar in Anemia Reduction among Women of Reproductive Age	IAngeles-Agdeppa, Ph.D., EAGoyena, FPSArias, GPAzana, JPDesnacido, MLVManiego	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Validation of Physical Activity, Sedentary Behavior, and Sleep Questionnaire for Philippines National Nutrition Survey	CFPatalen, MSNParani, JJPVicta, AJMCaro, CMIranzo, and GMGironella	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Vitamin A status of Filipino preschool children and pregnant women	MVCapanzana, Ph.D., IAngeles-Agdeppa, Ph.D., MBVargas, Ph.D.(†), GPAzaña, MESerafico, RJDumag, DPBriones, MVAlibayan, JRCUlanday and CDSumangue	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023

Title of Paper	Author/ Presenter	Place/Venue/ Conference	Date Presented
Move More for Healthier Filipino Teens	MMadrid, JPLabrador, NLSantos, HLat, SCarandang, LJGalon	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 6, 2023
Dietary Intake Patterns of Filipino Pregnant and Lactating Women based on a Nationwide Survey	EGoyena, PhD., JDesnacido, AJDucay	45th NAST Annual Scientific Meeting, The Manila Hotel	July 12-13, 2023
Food and Nutrient Consumption Patterns of Filipino Pregnant and Lactating Women: A 2018-2019 ENNS	EGoyena, PhD., JDesnacido, AJDucay	45th NAST-Annual Scientific Meeting, Manila Hotel	July 12-13, 2023
Snacking Patterns of Filipino Children: Frequency and Contribution to Energy and Dietary Intakes	MSerafico, EAGoyena, PhD., JPDesnacido, AJDDucay	45th NAST Annual Scientific Meeting, The Manila Hotel	July 12-13, 2023
Establishing Blood Pressure Norms for Filipino Children 3.0 to 17.9 years old	CPatalen, DBonzon, Ph.D., CCAcuin, Ph.D.	27th Annual Convention of the Pediatric NephrologySociety of the Philippines	November 14, 2023
Undiagnosed diabetes: The Silent Diabetes Epidemic Factos Associated with High Fasting Blood Glucose among Filipino Adults not Diagnosed with Diabetes	CPatalen, MSParani, AJDucay, CIranzo, CDuante	MMHRDC 7th International Symposium and 14th Annual Scientific Conference	November 23-24, 2023
Validation of Physical Activity, Sedentary Behaviour, and Sleep Questionnaire for Philippine National Nutrition Survey	CPatalen, MSParani, JJVicta, AJCaro, CIranzo, GMGironella	MMHRDC 7th International Symposium and 14th Annual Scientific Conference	November 23-24, 2023

POSTERS PRESENTED

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Posters Presented

INTERNATIONAL

Title of Paper	Author/Presenter	Place/Venue/ Conference	Date Presented
Molecular Detection of Salmonella spp. in retail eggs from Metro Manila markets	REGuilaran, CESevilla, EGBilledo, DACaballes, PBBuiser, and MGarin	International Workshop on Laboratory Quality Standards Towards Global Competitiveness, Acacia Hotel, Alabang, Muntinlupa City	May 23-25, 2023
Validation of microwave-assisted digestion for multi-element analysis in as consumed foods using ICP-OES	EBilledo, AApor, KNacionales, REGuilaran, and REPlacio	International Workshop on Laboratory Quality Standards Towards Global Competitiveness, Acacia Hotel, Alabang, Muntinlupa City	May 23-25, 2023
Validation of microwave-assisted hydrolysis, derivatization with phenylisothiocyanate, and high-performance liquid chromatography with ultraviolet detection for the determination of amino acids in selected foods	KBNacionales, RTanaka, ALDavid, MTSoriano, MABaylosis, ALundag, ILundag	International Workshop on Laboratory Quality Standards Towards Global Competitiveness, Acacia Hotel, Alabang, Muntinlupa City	May 23-25, 2023
Comparing two simplified questionnaire-based methods with 24-h recalls for estimating fortifiable wheat flour and oil consumption in Mandaluyong City, Philippines	CVCabanilla, VFriesen, JMiller, RBitantes, MReario, CArnold, MMbuya, LNeufeld, FWieringa, AStormer, MCapanzana, GLietz, MHaskell, REngle-Stone	International Conference on Diet and Activity Methods, Limerick, Ireland	June 26-29, 2023
Biofortified beta carotene rice meets more than one third of vitamin A requirement in the diet of Filipino women and young children	CVCabanilla, MLCumagun, EVillate, PAVega, MAGarcia, and IAngeles-Agdeppa, Ph.D.	Micronutrient Forum 6th Global Conference, The Hague, Netherlands	October 16-20, 2023

Cost of One-day Food Consumption of Households Meeting Requirements for Energy and Nutrients	MARRamirez, CJavier, and GMGironella	Micronutrient Forum 6th Global Conference, The Hague, Netherlands	October 16-20, 2023
Protecting health and nutrition rights of vulnerable groups in emergencies	MARRamirez, GSCaraig, and NBuyco	Micronutrient Forum 6th Global Conference, The Hague, Netherlands	October 16-20, 2023

LOCAL

Title of Paper	Author/Presenter	Place/Venue/ Conference	Date Presented
Development of Amino Acid Method for Generation of Philippine Food Composition Data	KBNacionales, RTanaka, ALDavid, MTSoriano, MABaylosis, ALundag, lLundag	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Evaluation of Laboratory Performance through Proficiency Testing in Corn-based Snack Food	LDajay, JCotara, JLaurea, MMartin, MGParcarey, and PAdona, Jr.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Fortified Rice Flour Reference Materials for Chemical Analysis	LDajay, JCotara, MGuerra, JLaurea, MMartin, MGParcarey, and PAdona, Jr.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Move More for Healthier Filipino Teens	MMadrid, JPLabrador, NLSantos, HLat, SCarandang, LJGalon	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023

Title of Paper	Author/Presenter	Place/Venue/ Conference	Date Presented
OPTIDIETS: Optimization of Low-Cost Nutritionally Adequate Diets for Filipinos Using a Web-based Analysis Tool	CVCabanilla, RCTan, MLCumagun, MAGironella, Cavier, EAArnejo, MSerafico, RGarcia, MCapanzana, Ph.D., CDuante, MLDasco	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Philippine Nutrient Profiling Model	MSerafico, CVCabanilla, DAguila, KNacionales, RCTan, ATorres, MCapanzana, PhD.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Pinggang Pinoy® Meals: How much minerals are available?	MLCumagun, AFBaquiran, JBGuilaran, CVCabanilla, MSerafico, MSBorlagdan, ADSabenecio, DMLeonardo, MDDionela	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Updating of Philippine Food Composition Tables (PhilFCT) Online Database and Mobile Application	KNacionales, RTanaka, ALDavid, MABaylosis, ALundag	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Shelf life, acceptability, and retention of red palm oil	ALPadrones, MCSaises, ABUmali, BDMMEspeño, JBLala	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Fortification of wheat flour with folic acid for the amendment of RA 8976 and updating of extruded iron rice premix specifications	ALPadrones, RLAlcaraz, MDAlbao, JBLala	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023

Development of Complementary Foods with Coconut to Help Combat Stunting Among Filipino Children 6 Months to Less than 2 Years Old	AMPalomo, VIRamas, CTSaldaña, CEAdona, FDPonte, RGAduana	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Discover Safe Eats: The Food Safety Guidelines for the Food Service Sectors	TTArcangel, VIRamas, CAJGMendoza, JLGRamirez,	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Development of Low Heat Low Humidity $(LH)^2$ Drying System and technology generation and pilot scale study of nutritious dried fruits and vegetables	CEAdona, RLAlcaraz, EMRamirez, JATagaroma, MJBRosales, HAVillamento, CTSaldaña, FDPonte, JMRACArquiza, Ph.D.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Dietary Patterns of Filipino Older Adults and Associated Factors from the 2013 National Nutrition Survey and 2018-2019 Expanded National Nutrition Survey	RCTan, KKCastilla, DKCMendoza, MSerafico, MMensink, LCPGMdeGroot	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Nourishing productive Filipinos through revitalizing meryenda: DOST-FNRI Healthy Snacks and Beverages for Adults	MADGironella, IGGlorioso, EABArnejo, VVCSalazar, SFQArevalo, ENCBacolod, JMMVillanueva, JDMCabillon, CLTBayalas, MCEPalompo, MSGonzales, Ph.D.	49th FNRI Seminar Series: "Innovative, Accessible and Affordable Diet for All: Products of R&D and S&T Services", Dusit Thani Hotel, Makati City, Metro Manila	July 5-6, 2023
Snacking pattern of school-age Filipino children and its contribution to their total energy intake	Pamela Mildred G. Rosales, Milfred P. Paca-anas, Rosemarie G. Garcia,	45th Annual Scientific Meeting, Manila Hotel	July 12-13, 2023
Mineral Availability of Pinggang Pinoy® Meals for Male Adults	Mario V. Capanzana, Ph.D., and Marcela C. Saises	37th Philippine Chemistry Congress, SMX Convention Center, Bacolod City, Negros Occidental	July 26-28, 2023

TECHNICAL TRAININGS

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Technology Transfer Trainings

TECHNOLOGY TRANSFER AND COMMERCIALIZATION TRAINING ON THE PRODUCTION OF FNRI-DEVELOPED FOOD TECHNOLOGIES

Title of Training/ Technology	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
Technology Transfer Training on the Production of Enhanced Nutribun Squash Variant Batch 18	Online training via Zoom	17 Licensees	January 20-24, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Enhanced Nutribun Carrot Variant Batch 7	Online training via Zoom	39 Licensees	February 10-13, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Tubig Talino for Bilibinwang Multipurpose Cooperative	Onsite training at Bilibinwang MPC, Bilibinwang. Agoncillo	1 Licensees	March 6-7, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Enhanced Nutribun Sweetpotato Variant Batch 9	Online training via Zoom	32 Licensees	March 14-16, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Tubig Talino for Fresh Q Enterprise Corporation	Onsite training at Fresh Q Enterprise Corporation, Sulucan, Angat, Bulacan	1 Licensee	April 24, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Iron Rice Premix & Iron Fortified Rice for CM & Sons Corporation	Onsite training at CM & Sons Corporation, Bacolod City, Negross Occidental	1 Licensee	May 9-12, 2023	DOST-FNRI Tech Transfer GF

Title of Training/ Technology	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
Technology Transfer Training on the Production of Squash Puree for Sentrong Pamilihan ng Produktong Agrikultura sa Quezon Foundation, Inc. (SPPAQFI)	Onsite training at Sentrong Pamilihan ng Produktong Agrikultura sa Quezon Foundation, Inc. Maharlika Highway, Brgy. Sampaloc 2, Sariaya, Quezon	1 Licensee	May 18-19, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Enhanced Nutribun Squash Variant, Batch 19	Online training via Zoom	11 Licensees	May 19-23, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Tubig Talino for CBL Water Refilling Station	Onsite training at CBL Water Refilling Station, Calauag, Quezon Province	1 Licensee	June 5-6, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Enhanced Nutribun Carrot Variant, Batch 8	Online training via Zoom	14 Licensees	June 16-19, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Iron Rice Premix & Iron Fortified* Rice for Aretei Foods Corporation	Onsite training at Aretei Foods Corporation, Marikina City	1 Licensee	June 15-19, 2023 September 25, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Iron Fortified Rice for D' Paragon AA Corporation	Onsite training at D' Paragon AA' Corporation, Davao City	1 Licensee	June 20-21, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Iron Fortified Rice for Swisspharma Research Laboratories Inc	Onsite training at Swisspharma Research Laboratories Inc., Cabuyao City Laguna	1 Licensee	June 22-23, 2023	DOST-FNRI Tech Transfer GF

Title of Training/ Technology	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
Technology Transfer Training on the Production of Rice Mongo Instant Blend and Rice-Mongo Curls for PLGU Zamboanga del Norte	Onsite training at PLGU Zamboanga del Norte Complementary Food Production Facility, Irasan, Roxas, Zamboanga del Norte	1 Licensee	July 26-29, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of DOST-FNRI-developed Nutritious Food Products such as, Rice Mongo Instant Blend, Rice Mongo Curls, Coco Puff, Coco Blend & Coco Bisc for JBM Food Products	Onsite training at JBM Food Products, Cabatuan, Isabela	1 Licensee	August 8-10, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Iron Fortified Rice for Great Foods Corporation	Onsite training at Great Foods Corporation, Arsenal, Iloilo City	1 Licensee	August 14-15, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of DOST-FNRI-developed Nutritious Food Products such as, Rice Mongo Instant Blend, Rice Mongo Curls, Coco Puff, Coco Blend, Coco Bisc & Iron Fortified Rice for Allycel General Merchandise	Onsite training at Allycel General Merchandise, Teresa, Rizal	1 Licensee	August 16-18, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer training on the Production of Rice-Mongo Instant Blend & Rice Mongo Curls for LGU-Aroroy, Masbate	Onsite training at LGU-Aroroy Food Processing Center, Aroroy, Masbate	1 Licensee	August 22-26, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Tubig Talino for Riverside Multi-Purpose Cooperative	Onsite training at Riverside Multi-Purpose Cooperative Bulihan, Nasugbu, Batangas	1 Licensee	September 6-7, 2023	DOST-FNRI Tech Transfer GF

Title of Training/ Technology	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
Technology Transfer Training on the Production of Enhanced Nutribun Sweetpotato Variant Batch 10	Online training via Zoom	15 Licensees	September 6-8, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Brown Rice Nutty-Fruity Bar for Allycel General Merchandise	Onsite training at Allycel General Merchandise, Teresa, Rizal	1 Licensee	September 12, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Iron Fortified Rice for Ma-an's Bakeshop	Onsite training at Ma-an's Bakeshop, Talomo, Davao City	1 Licensee	September 14-15, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Rice-Mongo Instant Blend & Rice Mongo Curls for LGU-Romblon	Onsite training at LGU-Romblon Complementary Food Production Facility, Odiongan, Romblon	1 Licensee	November 8-9, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Enhanced Nutribun Squash, Carrot & Sweetpotato Variants for Zarah's Market Grocery Products	Onsite training at DOST-FNRI Pilot Plant, Bicutan, Taguig City	1 Licensee	November 22-26, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Enhanced Nutribun Squash, Carrot & Sweetpotato Variants for Calzado Gen. Merchandise	Onsite training at DOST-FNRI Pilot Plant, Bicutan, Taguig City	1 Licensee	November 22-26, 2023	DOST-FNRI Tech Transfer GF
Technology Transfer training on the Production of Rice Mongo Instant Blend & Rice Mongo Curls for Iligan City National High School	Onsite training at Iligan City National High School,Iligan City, Lanao del Norte	1 Licensee	November 29-December 1, 2023	DOST-FNRI Tech Transfer GF

TECHNICAL TRAININGS ON DOST-*PINOY*

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DOST-*PINOY* Trainings

Title of Training/ Technology	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
Training Workshop on DOST PINOY Modules and Cooking Demonstration of Complementary Food Blends	Online via Zoom	30	April 25-26, 2023	DOST-RO V
Training Workshop on DOST PINOY Modules	Municipal Hall, Bokod, Benguet	17	May 31-June 1, 2023	DOST-CAR
Training Workshop on DOST PINOY Modules	Municipal Hall, Burgos, La Union	24	June 21-22, 2023	DOST-RO II
Training Workshop on DOST PINOY Modules and Cooking Demonstration of Complementary Food Blends	Municipal Hall, San Emilio, Ilocos Sur	55	August 9-10, 2023	DOST-RO II
Training Workshop on DOST PINOY Modules and Cooking Demonstration of Complementary Food Blends	Municipal Hall, Aringay, La Union	37	November 22-23, 2023	DOST-RO II
Training Workshop on DOST PINOY Modules	Online via Zoom	50	December 12-13, 2023	DOST-RO X

TECHNICAL TRAININGS ON NATIONAL NUTRITION SURVEY

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NNS Trainings

Title of Training	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
Introduction to Food Systems Work in the Philippines	Online via Zoom	100	January 18, 2023	NNS
ENNS General Orientation (Spill-over Areas)	DOST- FNRI Auditorium	133	January 25, 2023	NNS
ENNS General Orientation (Spill-over Areas)- Continuation (SDO and other matters)	DOST- FNRI Auditorium	133	January 26, 2023	NNS
Dietary e-DCS	DOST- FNRI Auditorium	20	February 1-6, 2023	NNS
Anthrop e-DCS	DOST- FNRI Auditorium	20	February 1-6, 2023	NNS
NNS Training on Anthropometry and Other Components for New Local Researchers (Batch 1)	ADMATEL -DOST	28	February 27 - March 3, 2023	NNS
NNS Training on Dietary Component for New Local Researchers (Batch 1)	MIRDC	28	March 6 - 10, 2023	NNS
NNS Training on Anthropometry and Other Components for New Local Researchers (Batch 2)	MIRDC	19	March 13 - 17, 2023	NNS
NNS Training on Dietary Component for New Local Researchers (Batch 2)	MIRDC	19	March 20 - 24, 2023	NNS
NNS Training on Anthropometry and Other Components for Old Local Researchers	Auditorium	133	March 17 - 22, 2023	NNS
NNS Training on Dietary Component for Old Local Researchers	Auditorium	133	March 22 -29, 2023	NNS

Title of Training	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
BP Certification training of Batch 1 and 2 NNS Trainees with the UP PGH	NAMD	47	March 25, 2023	NNS
Practicum of New Field Researchers (Batch 1 and 2)	K-Nine, Lower Bicutan	47	March 27 - 29, 2023	NNS
Practicum of Old Field Researchers (Food Weighing)	K-Nine, Lower Bicutan	110	March 30 - 31, 2023	NNS
NNS Training for Local Researchers (Batch 3)	DOST-FNRI Information Resource Station	13	April 12 - 28, 2023	NNS
BP Certification training of Batch 3 NNS Trainees with the UP PGH	NAMD	20	April 27, 2023	NNS
Keeping Each Other Safe: The Use of Psychological First Aid to Promote Mental Health (Thursdate)	Online via Zoom	100	May 11, 2023	NNS
Orientation-Training on "Introduction to Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV), specimen collection, transport, storage, and handling" among Biochemical staff	Online via Zoom	75	May 18, 2023	NNS
Orientation on Pre/Post-Counselling (in connection with the Viral 2023 NNS Hepatitis Seroprevalence Study)	Online via Zoom and FNRI Auditorium	291	May 19, 2023	NNS
2023 NNS Pilot Testing	Antipolo City and Binangonan, Rizal	40	May 24 - June 6, 2023	NNS
NNS training for Local Researchers (Batch 4)	DOST-FNRI Information Resource Station	8	May 29 - June 2, 2023	NNS
BP Certification training for the 4th Batch of NNS Trainees with the Philippine Society of Hypertension	NAMD	8	June 8, 2023	NNS

Title of Training	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
Orientation on Viral Hepatitis Seroprevalence Study (Clinical Component)	Online via Zoom		June 15, 2023	NNS
NNS training for Local Researchers (Batch 5)	DOST-FNRI Information Resource Station	19	June 16, 19 – 23, 2023	NNS
BP Certification training for the 5th Batch of NNS Trainees with UP PGH	NAMD	19	June 24, 2023	NNS
ENNS training for Local Researchers (Batch 6)	DOST-FNRI Information Resource Station	23	July 12 to August 2, 2023	NNS
ENNS training for Local Researchers (Batch 7)	DOST-FNRI Information Resource Station	6	July 25-31, 2023	NNS
Seoul International Congress on Endocrinology and Metabolism (SICEM) 2023	DOST-FNRI	5	July 25-31, 2023	NNS
Practicum of Batch 6 2023 NNS Trainees at K-9 Bicutan, Taguig City	K-9 Bicutan Taguig	22	August 1-2, 2023	NNS
Addressing Food and Nutrition Security in Challenging Times: Experiences in Southeast Asia Countries	DOST-FNRI	2	August 1 to 2, 2023	NNS
Orientation of newly hired ICOS for Evaluation of enhanced bread on the Vit A, iron and anthropometric status and dietary intake of 6-9 yrs old schoolchildren project	DOST-FNRI	1	August 8, 2023	NNS
4th Intensive Training Course on the Assessment of Nutritional Status and the 1st Nutritional Status Assessment Symposium	UP College of Public Health	16	August 14, 2023	NNS

Title of Training	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
ENNS training for Local Researchers (Batch 8)	DOST-FNRI Information Resource Station	5	October 11-20, 2023	NNS
Nutritional Assessment Training for Volunteers	Prime Hotel	20	October 11, 2023	NNS
Whole Grains in Southeast Asia: Health Benefits, Regulations, Dietary Guidelines and Consumption	DOST-FNRI	3	October 11-20, 2023	NNS
Conducted two-day 24 Hr Food Recall Method training among HKI fieldworkers	Sorsogon City, Sorsogon	12	November 6 - 7, 2023	NNS
NNS Training for Field Researchers (Batch 1 for 2024)	NAMD Encoders' Room	23	November 28 - December 19, 2023	NNS
MMHRDC 7th International Symposium and 14th Annual Scientific Conference	DOST-FNRI	2	November 28 - December 19, 2023	NNS
NNS Year-end evaluation	Villa Excellance Beach and Wave Pool Resort, Tanza, cavite	40	December 14, 2023	NNS
Conducted debriefing activities	Villa Excellance Beach and Wave Pool Resort, Tanza, cavite	453	December 15, 2023	NNS

NNS Dissemination

Title of Training	Venue	No. of Participants	Inclusive Dates Conducted	Funding Source
NNS Dissemination	Sheraton Hotel Manila, Pasay City	150	December 12, 2023	NNS

2023 AWARDS

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International Recognitions

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Local Recognitions

INTERNATIONAL RECOGNITIONS

Title of the Award	Awardee	Date	Venue
Best Poster during the International Workshop on Laboratory Quality Standards towards Global Competitiveness of the Asia Pacific Food Analysis Network (APFAN) Poster Title: Validation of Microwave-assisted Digestion for Multi-element Analysis in as-consumed Foods using ICP-OES	EBilledo, AApor, KNacionales, REGuilaran, and RE Placio	May 23-25, 2023	Acacia Hotel, Muntinlupa
Young Investigator Conference Travel Award during the 14th Asian Congress of Nutrition	RCTan and HLat	September 14-17, 2023	Chengdu, China
Stabilized Brown Rice - Bronze Prize award - 2023 Seoul International Invention Fair	Engr. RGGarcia, DADiaz, AMPalomo, RBNavarro, MRLadia	November 1-4, 2023	COEX Exhibition Hall, Gangnam-gu, Seoul, South Korea
Kayumanggi Stabilized Brown Rice - Special Award from the Indonesian Invention and Innovation Promotion Association (INNOPA) - 2023 Seoul International Invention Fair	DOST-FNRI	November 1-4, 2023	COEX Exhibition Hall, Gangnam-gu, Seoul, South Korea
4th Place - Diet Books Category at the 29th International Gourmand Awards 2023 - Saudi Feast Food Festival	MADGironella, IGGlorioso, EABArnejo, VVCSalazar, SFQArevalo, ENCBacolod, JDMCabillon, JMMVillanueva, CLTBayalas, MCEPalompo, MSGonzales, Ph.D.	November 27-29, 2023	Riyadh, Saudi Arabia

LOCAL RECOGNITIONS

Title of the Award	Awardee	Date	Venue
Certificate of Accreditation PNS ISO/IEC 17043:2010 Proficiency Testing Provider	DOST-FNRI Proficiency Testing Laboratory	May 03, 2023	Acacia Hotel, Alabang
2023 DOST Intellectual Property Awards - International Publication Award Lipote Fruit Anthocyanin-Rich Extracts as Food Colourants: Extraction Optimization and Stability of Natural and Copigmented Anthocyanins	RGRodriguez, RSSagum, TPTrinidad	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Adherence to age-appropriate feeding practices among Filipino children under two: An analysis of the 2018-2019 expanded National Nutirion Survey	EAGoyena,Ph.D., MLManiego	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Determinants of Overweight/ Obesity among Filipino Adolescents: 2018 Expanded National Nutrition Survey	JPDesnacido, MLPDasco, AJDDucay, CADuante, IAngeles-Agdeppa, Ph.D.	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Provision of chemical proficiency testing round on corn-based snack food for laboratories in the Asia-Pacific	JCotara, LDajay, MGuerra, MMartin, JLaurea, PAdona, Jr., MGParcarey, CCapili	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Estimation of Free Sugars in the Filipino Food Composition Table and Evaluation of Population-Level Intake	FManardi, VCCampos, RGCote, NKSilber, RPlestina, IAngeles-Agdeppa, Ph.D.	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award The Effects of Coconut Skim Milk and Coco-Dairy Milk Blend on the Nutritional Status of Schoolchildren	IAngeles-Agdeppa, Ph.D., JATZamora	November 27, 2023	Philippines International Covention Center, Pasay

Title of the Award	Awardee	Date	Venue
2023 DOST Intellectual Property Awards - International Publication Award Drivers and Barriers of Whole Grain Consumption in the Philippines: 2019 Expanded National Nutrition Survey	IAngeles-Agdeppa, Ph.D., JPDesnacido, AJDucay, CADuante, KPhanvijhitsiri	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Breakfast in the Philippines: food and diet quality as analyzed from the 2018 Expanded National Nutrition Survey	IAngeles-Agdeppa, Ph.D., MRSCustodio, MBToledo	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award The Philippines' snapshot situation of pregnancy-related and child feeding practices during the COVID-19 pandemic	IAngeles-Agdeppa, Ph.D., EAGoyena, Ph.D., MLVManiego	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Development of Phil-HEI and its evaluation of the Filipino diet: 2018 Expanded National Nutrition Survey	IAngeles-Agdeppa, Ph.D., MBToledo, JMSDariagan, JATZamora	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Determinants of Underweight and Stunting among 6–59-months-old Indigenous Children in the Philippines	RViajar, JDorado, MLManiego JJGulay, PlAmita, IAngeles-Agdeppa, Ph.D.	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Unmasking the Real Effect of Gender of Household Head in Household Food Security in the Philippines	MOGuirindola, Ph.D., CGCustodio, Jr., JDVillanueva, RBGuirindola	November 27, 2023	Philippines International Covention Center, Pasay

Title of the Award	Awardee	Date	Venue
2023 DOST Intellectual Property Awards - International Publication Award Developing and pre-testing of nutrition cartoon video to promote healthy eating among hearing and deaf and mute children	IGGlorioso, SFQArevalo, MBSDecena, TKBJolejole, MSGonzales, Ph.D.	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Validity and reliability of online questionnaire on awareness, knowledge, attitude and self-efficacy (AKAS) on healthy eating for nutrition education and promotion	MSGonzales, Ph.D., IGGlorioso, CAJNavarro, TKBJolejole	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award 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	CVCabanilla, REngle-Stone, JCMiller, MFReario, CDArnold, AStormer, ELafuente, AOxley, MVCapanzana, Ph.D., JFord, AClark, TPVelavan, KHBrown, GLietz, MJHaskell	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Comparing two simplified questionnaire-based methods with 24-h recalls for estimating fortifiable wheat flour and oil consumption in Mandaluyong City, Philippines	CVCabanilla, VMFriesen, JCMiller, RBBitantes, MFReario, CDArnold, MNMbuya, LMNeufeld, FTWieringa, AStormer, MVCapanzana,Ph.D., GLietz, MJHaskell, REngle-Stone	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Risk Profiling of Aflatoxin in Peanut (Arachis hypogaea L.) to the Filipino Consuming Population	ARustia, CBMariano, KABautista, DMahoney, EBarrios, CBVillarino, MLimon, MVCapanzana, Ph.D.	November 27, 2023	Philippines International Covention Center, Pasay

Title of the Award	Awardee	Date	Venue
2023 DOST Intellectual Property Awards - International Publication Award Risk Profiling of Beta-agonists in the Consumption of Pork by the Filipino Consuming Population	ARustia, MATan, FPMagtibay, KABautista, DMahoney, EBarrios, CBVillarino, JNones, DADimaya, JLoria, MVCapanzana, Ph.D.	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Prevalence and Factors Associated with Hypertension among Filipino Adults in Different Survey periods	CFPatalen, MSNParani, AJDDucay, KDAlnso, AGCristobal, MLPDasco, CADuante	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Validity of Body Roundness Index to Screen Abnormal Blood Lipid among Filipino Adults	JCRMorillo, ERBullecer, CFPatalen	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Socio-demographic Determinants of Filipino Consumers Reading Food Product Labes and Nutrition Facts: Findings from the 2018-2019 ENNS	CAJavier, MVCapanzana, Ph.D., SSGohilde	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Nutrition in Times of Crisis: A Qualitative Study in Siargao Island, Philippines, during the COVID-19 Pandemic	GLasco, VGYu, JMCompra, PLeuangvilay, RSuphanchaimat, YZhang, CAJavier	November 27, 2023	Philippines International Covention Center, Pasay
2023 DOST Intellectual Property Awards - International Publication Award Comparison of cardiovascular disease risk factors among FiLWHEL (2014-2016), NNS (2013) and KNHANES (2013-2015) women	SMPProvido, GPAbris, HLee, APOkekunle, GMGironella, MVCapanzana, GHChung, SHong, SHYu, CBLee & JELee	November 27, 2023	Philippines International Covention Center, Pasay

Title of the Award	Awardee	Date	Venue
FNRI Recognition, International Publication Award: Association of household food security and dietary diversity of mother-child pairs in the Philippines	MOGuirindola, Ph.D., MLManiego	December 19, 2023	DOST-FNRI
FNRI Recognition, International Publication Award: Do school-based nutrition interventions improve the eating behavior of school-age children?	NBuyco, JDorado, GAzaña, RViajar, DAguila, MCapanzana, Ph.D.	December 19, 2023	DOST-FNRI
FNRI Recognition, International Publication Award: Monitoring the implementation of nutrition intervention at the local level	RViajar, JDorado, ERongavilla, GCaraig, JJGulay	December 19, 2023	DOST-FNRI
FNRI Recognition, International Publication Award: Risk factors of stunting during the complementary feeding period 6-23 months in the Philippines	MOGuirindola, Ph.D., EGoyena, Ph.D, MLManiego	December 19, 2023	DOST-FNRI
FNRI Recognition, International Publication Award: 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	ERongavilla, JDorado, GCaraig, RViajar, GAzaña, EFerrer, DDomiquel, JYgaña, MCapanzana, Ph.D.	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Adherence to Age-appropriate Feeding Practices Among Filipino Children Under Two: An Analysis of the 2018-2019 Expanded National Nutrition Survey	EGoyena, Ph.D., MLManiego	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Assessment of the Quality of Inpatient Meals and Nutrition and Dietetics Service Processes in Select Philippine Public Hospitals	EGoyena, Ph.D., JPlaton-Desnacido, MCajucom, lAngeles-Agdeppa, Ph.D.	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
FNRI Recognition, Scientific Technical Writer Award Considerations for Modeling a Broad Food Tax in the Philippines and other Low-income and Middle-income countries	EGoyena, Ph.D., JPlaton-Desnacido, IAngeles-Agdeppa, Ph.D.	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Determinants of Underweight and Stunting among 6–59-months-old Indigenous Children in the Philippines	RViajar, JDorado, MLManiego JJGulay, PlAmita, IAngeles-Agdeppa, Ph.D.	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Developing and pre-testing of nutrition cartoon video to promote healthy eating among hearing and deaf and mute children	IGlorioso, SFArevalo, MBDecena, TKJolejole, and MGonzales, Ph.D.	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Dietary Exposure of Filipinos to Ochratoxin A and Glyphosate from Commonly-consumed Foods using the Theoretical Maximum Daily Intake (TMDI) Approach	REGuilaran, RApilado, Ph.D., RATeodoro, and EBilledo	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Government-Industry-Academia alliance: A Muti-Sectoral Collaboration for Improved Nutrition of Children and Well-Being of Mothers	DAguila, JDorado, and MCapanzana, Ph.D.	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Monitoring the Consumption of Sugar-Sweetened Beverages: An Input to RA No. 10963	MLDasco, JPlaton-Desnacido, AJDucay, CDuante, MVargas	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
FNRI Recognition, Scientific Technical Writer Award Prevalence and Factors Associated with Hypertension among Filipino Adults in Different Survey Periods	CPatalen, MSParani, AJDucay, KDInso	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Socio-demographic Determinants of Filipino Consumers Reading Food Product Labels and Nutrition Facts: Findings from the 2018-2019 ENNS	CJavier, MCapanzana, Ph.D., SGohilde	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Validity and reliability of online questionnaire on Awareness, Knowledge, Attitude and Self-efficacy (AKAS) on healthy eating for nutrition education and promotion	MGonzales, Ph..D., IGlorioso, CANavarro, and TKJolejole	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Validity of Body Roundness Index to Screen Abnormal Blood Lipid among Filipino Adults	CPatalen JCMorillo, EBullecer	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award A study protocol for a pilot randomized controlled trial to evaluate the effectiveness of a gene-based nutrition and lifestyle recommendation for weight management among adults: the MyGeneMyDiet® study	JNacis, JPLabrador, DGRonquillo, MRodriguez, AMFDablo, RFrane, MMadrid, NLSantos, JJCarillo, MGFernandez, and GBGonzales	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
FNRI Recognition, Scientific Technical Writer Award Comparing two simplified questionnaire-based methods with 24-h recalls for estimating fortifiable wheat flour and oil consumption in Mandaluyong City, Philippines	CVCabanilla, VFreisen, JMiller, RBitantes, MRearIo, CArnold, MMbuya, LNeufeld, FWieringa, AStormer, MCapanzana, Ph.D., GLietz, MHaskell, and REngle-Stone	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Landscape of genetic counselling in the Philippines	FIacalan, PJAbad, MJTumulak, RGuerbo, Lde Castro-Hamoy, NGBautista, R\Nique, GLTalapian, EFelipe-Dimog, JBLagarde, SJPlaga, EJJover, KDMorales, GMCanoy and MLaurino	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Snacking Patterns of Filipino Children: Frequency and Contribution to Energy and Dietary Intakes	MSerafico, EGoyena, JDesnacido and AJDucay	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award The Interindividual Variability of Phytofluene Bioavailability is Associated with a Combination of Single Nucleotide Polymorphisms	MPZumaraga, PBorrel, RBott, MNowicki, DLairon, and CDesmarchelier	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award Volatiles Fingerprinting of Aromatic Rice Cultivars for Varietal Discrimination Using Gas Chromatography-Flame Ionization Detector	MSerafico	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
FNRI Recognition, Scientific Technical Writer Award Food Intake Patterns of Filipino Pregnant and Lactating Women Based on a Nationwide Survey	MOGuirindola, CGCustodio, Jr., JDVillanueva, RBGuirindola	December 19, 2023	DOST-FNRI
FNRI Recognition, Scientific Technical Writer Award: Unmasking the Real Effect of Gender of Household Head in Household Food Security in the Philippines	MOGuirindola, Ph.D., CGCustodio, Jr., JDVillanueva, RBGuirindola	December 19, 2023	DOST-FNRI
FNRI Recognition, Popular Writer Award (Print Media)	CAJavier	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Fortified Protein Cookie	MSaises, APadrones, TKJolejole, AUmali, JLRamirez, RSabado, and JLala	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Process for Producing Fortified Protein Cookie	MSaises, APadrones, TKJolejole, AUmali, JLRamirez, RSabado, and JLala	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Fortified Protein Cracker	MSaises, APadrones, TKJolejole, AUmali, JLRamirez, RSabado, and JLala	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Process for Producing Fortified Protein Cracker	MSaises, APadrones, TKJolejole, AUmali, JLRamirez, RSabado, and JLala	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Process for Producing an Enteral Formula	APalomo, JPalafox, Ranis, RAduana, CAdona, and FPonte	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Ready-to-drink Milk Beverage made of Coconut Milk and Goat Milk	APadrones, lAngeles-Agdeppa, Ph.D., RAlcaraz, MAlbao, CAdona, AUmali, BDMEspeno, JLala, and MSaises	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Ready-to-drink Milk Beverage made of Coconut Milk and Cow Milk	APadrones, lAngeles-Agdeppa, Ph.D., RAlcaraz, MAlbao, CAdona, AUmali, BDMEspeno, JLala, and MSaises	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
Inventor's Award - Utility Model Extruded Snack with Coconut Flour	APalomo, VRamas, CSaldana, CAdona, lAngeles-Agdeppa, Ph.D., RAduana, JPalafox, and FPonte	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Process of Producing Ready-to-Eat Cereal Composition Fortified with Resistant Starch	TArcangel, VRamas, JLRamirez, JVTiama, and RPayag	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Process of Producing Instant Baby Food Powder with Coconut Flour	APalomo, VRamas, CSaldana, CAdona, lAngeles-Agdeppa, Ph.D., RAduana, JPalafox, and FPonte	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Process of Producing Ready-to-drink Milk Beverage	APadrones, lAngeles-Agdeppa, Ph.D., RAlcaraz, MAlbao, CAdona, AUmali, BDMEspeno, JLala, and MSaises	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Process of Producing Extruded Snack with Coconut Flour	APalomo, VRamas, CSaldana, CAdona, lAngeles-Agdeppa, Ph.D., RAduana, JPalafox, and FPonte	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Enteral Formula	APalomo, JPalafox, RPanis, RAduana, C Adona, and FPonte	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Ready-to-drink Milk Beverage made of Coconut Milk and Carabao Milk	APadrones, lAngeles-Agdeppa, Ph.D., RAlcaraz, MAlbao, CAdona, AUmali, BDMEspeno, JLala, and MSaises	December 19, 2023	DOST-FNRI
Inventor's Award - Utility Model Ready-to-Eat Cereal Composition Fortified with Resistant Starch	TArcangel, VRamas, JLRamirez, JVTiama, and RPayag	December 19, 2023	DOST-FNRI
Inventor's Award -Copyright DOST-FNRI Food Safety Grading System Tools AVP: Introduction	EAArnejo, MAGironella, JCSamonte, CGacias, and KAKua	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright DOST-FNRI Food Safety Grading System Tools AVP: Food Inspection Checklist (FIC)	EAArnejo, MAGironella, JCSamonte, CGacias, and KAKua	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
Inventor's Award - Copyright DOST-FNRI Food Safety Grading System Tools AVP: Feedback from Stakeholders	EAArnejo, MAGironella, JCSamonte, CGacias, and KAKua	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright DOST-FNRI Food Safety Grading System Tools AVP: Operations Manual (OM)	EAArnejo, MAGironella, JCSamonte, CGacias, and KAKua	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright DOST-FNRI Food Safety Grading System Tools AVP: Code of Standards (COS)	EAArnejo, MAGironella, JCSamonte, CGacias, and KAKua	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Ang Mahiwagang Pinggang Pinoy ng Nutrilandia Chapter 1	IGlorioso, SArevalo, MB Decena, TKJolejole, AMalit, and MGonzales, Ph.D	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Supporting Adolescent Growth in the Philippines Nutrition and Food Safety Assessment Activity 3 (Version 1)	NLSantos, HLat, KKCastilla, MMadrid, JPLabrador, ALDalisay, and JCDe Torres	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright eKusina - Soya-Bano Shake with Chia Seeds	MAGironella, IGlorioso, ENBacolod, EAArnejo, VVSalazar, SFArevalo, JDCabillon, ERebato, CLBayalas, JMillanueva, and MGonzales, Ph.D.	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright eKusina - No Fry Empanada	MAGironella, IGlorioso, ENBacolod, EAArnejo, VVSalazar, SFArevalo, JDCabillon, ERebato, CLBayalas, JMillanueva, and MGonzales, Ph.D.	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright eKusina - Watermelon-Upo Juice	MAGironella, IGlorioso, ENBacolod, EAArnejo, VVSalazar, SFArevalo, JDCabillon, ERebato, CLBayalas, JMillanueva, and MGonzales, Ph.D.	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright eKusina - Carrot Tupig	MAGironella, IGlorioso, ENBacolod, EAArnejo, VVSalazar, SFArevalo, JDCabillon, ERebato, CLBayalas, JMillanueva, and MGonzales, Ph.D.	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
Inventor's Award - Copyright Supporting Adolescent Growth in the Philippines (SAGIP) Nutrition and Food Safety Assessment Activity 1 (Version 1)	NLSantos, HLat, KKCastilla, MMadrid, JPLabrador, ALDalisay, and JCDe Torres	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Supporting Adolescent Growth in the Philippines: Student Planner (Version 1)	NLSantos, HLat, KKCastilla, MMadrid, JPLabrador, ALDalisay, and JCDe Torres	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Supporting Adolescent Growth in the Philippines (SAGIP) Nutrition and Food Safety Assessment Activity 2 (Version 1)	NLSantos, HLat, KKCastilla, MMadrid, JPLabrador, ALDalisay, and JCDe Torres	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Squash Puree 90 Technology Manual	CAdona, JTagaroma, RATeodoro, ERamirez, FLGarcia, RAlcaraz, FPonte, RCastante, and CSaldaña	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright 2023 Menu Guide Calendar "Healthy Snacks and Beverages for Adults"	MAGironella, IGlorioso, EAArnejo, VVSalazar, SFArevalo, ENBacolod, JMVillanueva, CLBayalas, JDabillon, ERebato and MGonzales, Ph.D.	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Physical Fitness Tests for Adolescents: An Instructional Guide for Educators (Filipino Version)	MMadrid, NLSantos, HLat, JPLabrador, SCarandang, LJGalon, ALDalisay, JCDe Torres, and PTrinidad	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Physical Fitness Tests for Adolescents: An Instructional Guide for Educators (English Version)	MMadrid, NLSantos, HLat, JPLabrador, SCarandang, LJGalon, ALDalisay, JCDe Torres, and PTrinidad	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Ang Mahiwagang Pinggang Pinoy ng Nutrilandia Chapter 2	IGlorioso, SFArevalo, CLBayalas, ENBacolod, JMVillanueva and MGonzales, Ph.D.	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
Inventor's Award - Copyright Ang Mahiwagang Pinggang Pinoy ng Nutrilandia Chapter 3	IGlorioso, SFArevalo, CLBayalas, ENBacolod, JMVillanueva and MGonzales, Ph.D.	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Technology Manual: Coco Bisc	APalomo, VRamas, CSaldana, CAdona, FPonte, RAduana, and JPalafox	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Technology Manual for the Production of Multi-Nutrient Extruded Rice Kernel-11 (MNERK-11) for Pregnant and Lactating Mothers	APadrones, RAlcaraz, C Adona, AUmali, BDMEspeno, MAlbao, JLala, and RPanis	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Your Safety Guide to Exercise and Sports	MMadrid, NLantos, SCarandang, LJGalon, HLat, and JPLabrador	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Your Safety Guide to an Active Lifestyle	MMadrid, NLantos, SCarandang, LJGalon, HLat, and JPLabrador	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright 60-Minute-Challenge-Make Physical Activities Become your Daily Habit	MMadrid, NLantos, SCarandang, LJGalon, HLat, and JPLabrador	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Nutrinet 25th Anniversary Souvernir Program	DDe Leon	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Nutrinet 30th Anniversary Souvernir Program	DDe Leon	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Technology Manual on the Production of MGM-15 for Pregnant and Lactating Mothers	APadrones, RAlcaraz, C Adona, AUmali, BDMEspeno, MAlbao, JLala, and RPanis	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Nutrinet 35th Anniversary Souvernir Program	DDe Leon	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Technology Manual for the Production of Coco-Dairy Milk Blends	APadrones, IAngeles-Agdeppa, Ph.D., RAlcaraz, MAlbao, JLala, RPanis, AUmali, and BDMEspeno	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
Inventor's Award - Copyright Technology Manual: Coco Puff and Coco Blend	APalomo, VRamas, CSaldana, CAdona, FPonte, and RAduana	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Nutrinet 35th Anniversary Audio-Visual Presentation	DDe Leon, JMVillanueva, GJAbad and MBDecena	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Behind Numbers: Compilation of Food and Nutrition Media Collaterals	SSerrano, IGlorioso, MGonzales, Ph.D., AOrtiz, NBristol, JGonzales, LLandicho, DDe Leon, MBDecena, SFArevalo, ENBacolod, and JMVillanueva	December 19, 2023	DOST-FNRI
Inventor's Award - Copyright Testimonial Video of Former Nutrinet Members	DDe Leon and GJAbad	December 19, 2023	DOST-FNRI
Inventor's Award - Trademark Behind Numbers	NBristol, SSerrano, IGlorioso, MGonzales Ph.D.	December 19, 2023	DOST-FNRI
Inventor's Award -Trademark Nutrition Physiology Laboratory	RCTan, HLat, DKMendoza, MVelasquez, CLLim, KKCastilla, MKTorres, KMacatangay and VLANamocatcat	December 19, 2023	DOST-FNRI
National Award Philippine Quality Award (PQA) Team Composition Recognition for Proficiency in Quality Management	JViriña, RDumag, DAguila, AOrtiz, EFerrer, REstrella, JDuldulao, CESevilla, IGlorioso, MLDasco, TArcangel, MAguilos, MMoe, MHernandez, DSy, GMGironella, CDuante, MAJavier, MLManiego, AJDucay, CSumangue, NBristol, JNacis, CVCabanilla, HBarrientos, DDeLeon, MHernandez, DBriones, LLandicho, JMercado, JGonzales, HJBallester. LDajay, SPepito, IMMaravillas, JDuldulao, KNacionales, JLaurea, JMedina, JDRupido, MAMillenas, MBorlagdan	December 19, 2023	DOST-FNRI
National Award Student Achiever UP Diliman	MARRamirez	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
National Award 2022 DOST-International Publication Award: Right Diet for the Right Person: A Focus Group Study of Nutritionist-Dietitians' Perspective on Nutritional Genomics and Gene-based Nutrition Advice Journal of Community Genetics	JNacis, M Galang, JPLabrador, MGonzales, Ph.D., AMFDablo, DGDomalanta-Ronquillo, VFAlfonso Jr., IGlorioso, and MRodriguez	December 19, 2023	DOST-FNRI
National Award 2022 DOST-International Publication Award: Genotype Effects on β-Carotene Conversion to Vitamin A: Implications on Reducing Vitamin A Defficiency in the Philippines Food and Nutrition Bulletin	MPZumaraga, JMReynaldo, AArquiza, MAConcepcion, LPerlas, MNAlcudia-Catalma, and MRodriguez	December 19, 2023	DOST-FNRI
National Award 2022 DOST-International Publication Award: 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 Journal of the ASEAN Federation of Endocrine Societies	MP Zumaraga, MAConcepcion, CDuante, and MRodriguez	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, supervisory, OD	MAguilos	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, non-supervisory, OD	MCaranto	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory, OD	KAPiñas	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, supervisory, FAD	HBarrientos	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory, FAD	MAlmazan	December 19, 2023	DOST-FNRI

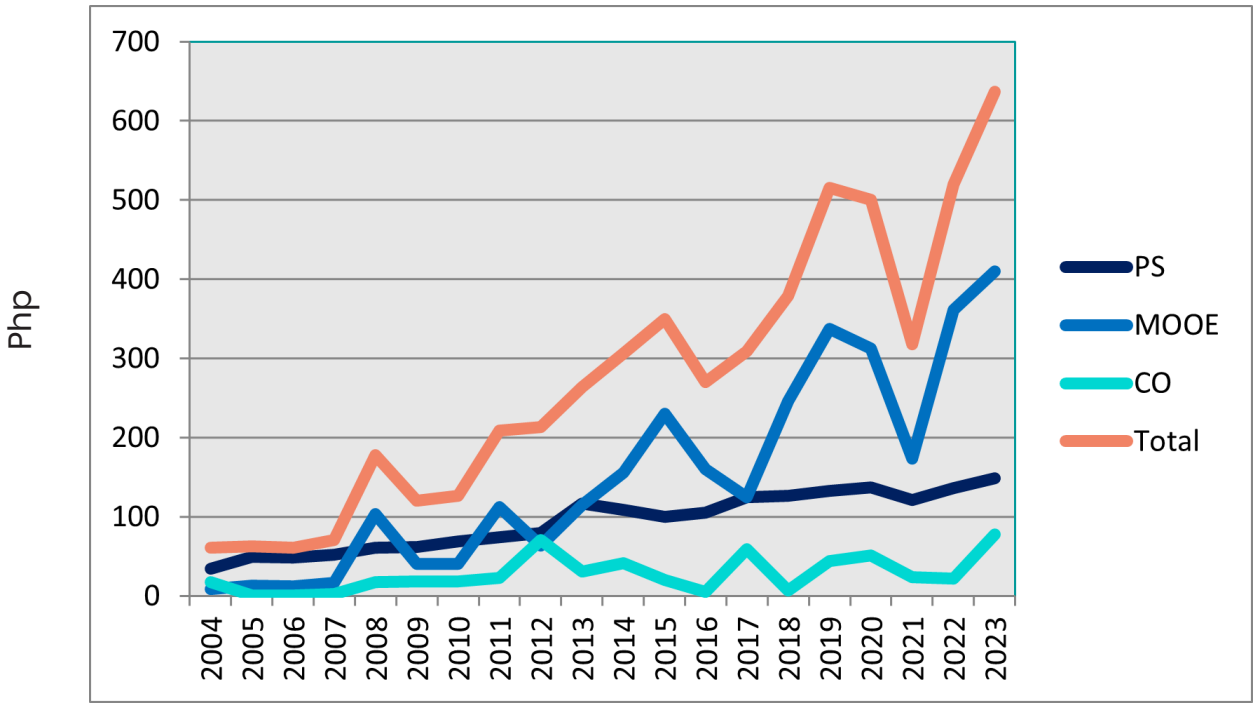
Title of the Award	Awardee	Date	Venue
FNRI Recognition, Model Employee, permanent, non-supervisory, FAD	RABasilio	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, non-supervisory, FAD	RMalinao	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, supervisory, NAMD	JDesnacido	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory, NAMD	ACristobal	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, non-supervisory, NAMD	NCortez	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, non-supervisory, NAMD	RSarad	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, supervisory, TDSTSD	SFArevalo	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory, TDSTSD	JBObero	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, non-supervisory, TDSTSD	MAQuiambao	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, non-supervisory, TDSTSD	LASila	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, supervisory, NRDG	DGRonquillo	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory, NRDG	ALDalisay	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, non-supervisory, NRDG	ATorres	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, non-supervisory, NRDG	PTrinidad	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, supervisory, FRDG	APadrones	December 19, 2023	DOST-FNRI

Title of the Award	Awardee	Date	Venue
FNRI Recognition, Model Employee, non-permanent, supervisory, FRDG	AApor	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, non-supervisory, FRDG	ALDavid	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, non-supervisory, FRDG	JDCabillon	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, supervisory, SLG	CESevilla	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory, SLG	RARosales	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, non-supervisory, SLG	MCastillo	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, non-supervisory, SLG	HPatalen	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, supervisory, Agency level	HBarrientos	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory, Agency level	KAPiñas	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, permanent, non-supervisory, Agency level	ALDavid	December 19, 2023	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, non-supervisory, Agency level	LSila	December 19, 2023	DOST-FNRI
FNRI Recognition, Exemplary Attendance and Punctuality Award	MBalitaon	December 19, 2023	DOST-FNRI

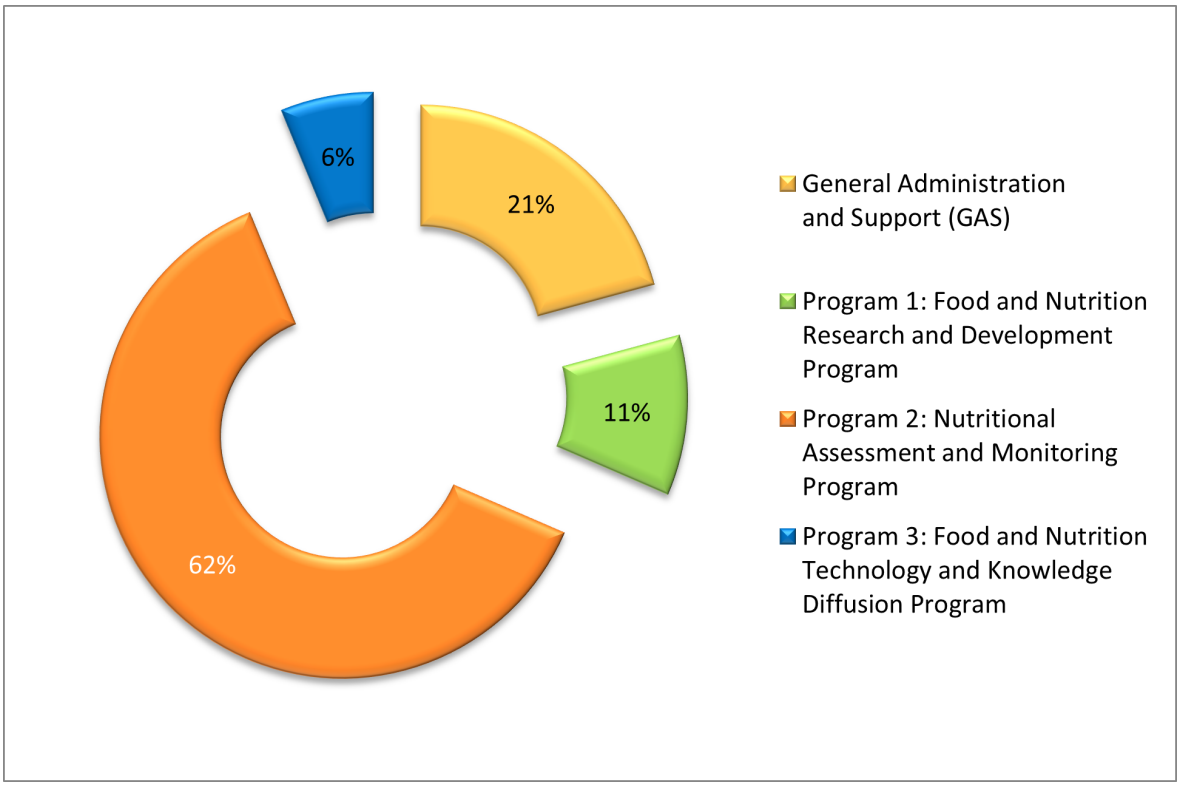
Title of the Award	Awardee	Date	Venue
FNRI Recognition, Service Recognition Award	HJBallester, EBilledo, MCastillo, RFrane, FCIsla, MNMesiona, MSParani, MPelagio, DGRonquillo, CSumangue, SFArevalo, ABoñola, DACaballes, JCotara, ALDavid, JJGulay, DKMendoza, DAMonter, VRamas, APAfuang, LLandicho, HLat, JMercado, RAlcaraz, AJDucay, SPepito, JFlorendo, ABaquiran, ERebato, JAgaban, MAlibayan, DDe Leon, EFerrer, REGuilaran, JRUlanday, MBorlagdan, JDe Juan, MAGironella, CESevilla, RCTan, JViriña, MBalitaon, CVCabanilla, MCajucom, LDajay, JDesnacido, JDuldulao, GMGironella, SGulla, FIJacalan, MAavier, MLManiego, KNacionales, JNacis, APadrones, APalomo, JTarlit, MPZumaraga, DBriones, CJavier, FBragas, CGacias, ZLabrague, CPatalen, FPonte, MSerafico, TArcangel, G Azaña, HBarrientos, RDumag, EGoyena, PhD, MJGubat, PhD, AOrtiz, DAguila, SBanta, MGuirindola, PhD, MSVelasco, RViajar, Eamirez, CAdona, ERongavilla, MBugas, PhD, LHuelar, MAguilos, GCaraig, MLDasco, MMadrid, MMoe, SSerrano, Majan, MFCarizo, LCuaterno, MCPalompo, REstrella, MHRPilariza, MBNueva España, IGlorioso, MGonzales, PhD, RLlamas, ASabenecio, NCortez, CDuante, JGonzales, RPanis	December 19, 2023	DOST-FNRI
FNRI Recognition, Loyalty Award	AFBaquiran, ERebato, MCPalompo, ASabenecio, ERamirez, LCuaterno, RDumag, GAzaña, TArcangel	December 19, 2023	DOST-FNRI
Sports Award 2nd Place Women's Volleyball DOST Wide Sports Fest	JMedina, MVelasquez, LCasas, NMalinao, Jaquiaog, RPAguilar, IMMaravillas, CJMendoza, CLMolano, MAlibayan	December 19, 2023	DOST-FNRI

Financial and Human Resource Management

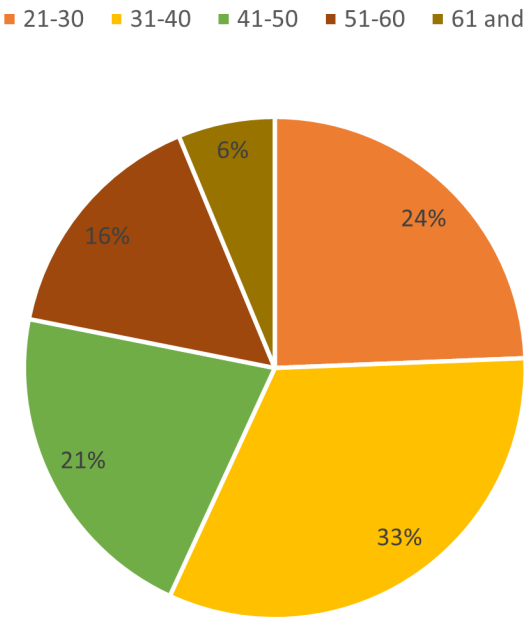
Budget Trends by Expense Class, 2004- 2023



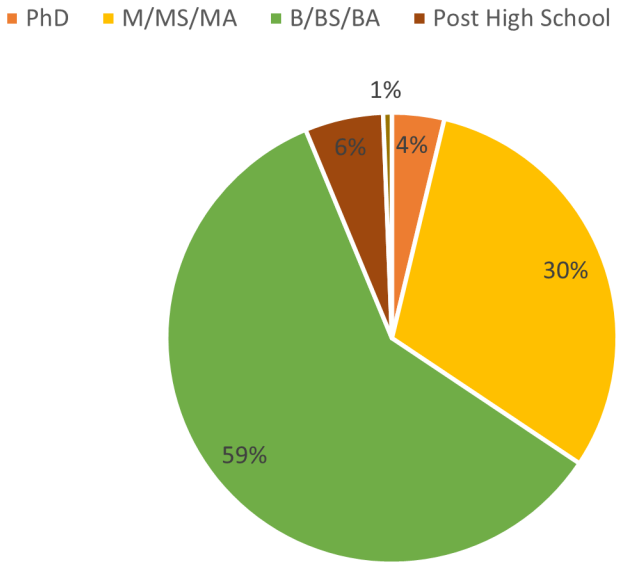
Expenditure by Expense Program, 2023



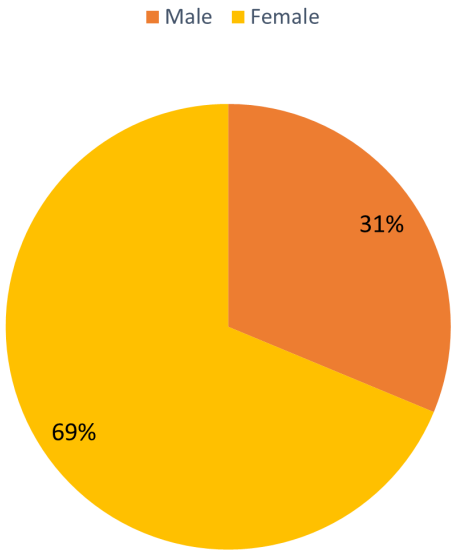
Profile of DOST-FNRI Personnel by Age Group



Profile of DOST-FNRI Personnel by Educational Attainment



Profile of DOST-FNRI Personnel by Sex



Resource Generation

Breakdown of Cash Resources Generated	
Release for current operating requirements from DBM on GAA CY 2023 (includes revalidation of reverted NCAs during the year)	Php 669,383,758.02
Release for payment of terminal leave and other payables from DBM	Php 8,053,999.98
DOST Sub Allotment for current year DOST-GIA Projects Demonstrator	Php 133,986,404.65
Release for project implementation from goevernment agecies	Php 1,550,692.54
Release for project implementation from NGOs and local private companies	Php 2,346,678.58
Release for project implementation from international organization and companies	Php 12,699,691,04
Proceeds from sale of bid documents, trainings and seminars Reviewer	Php 1,325,809.36
Total:	Php **816,647,343.13**

Non-Cash	
Public Private Partnerships (PPP) - Printing of Nutrition Planner - Mercury Drug - Promoting Good Nutrition and Wellness through MTVs	Php 1,550,120
Media Mileage Generated	Php 1,298,981,003
Total:	Php **1,300,531,123**

NON-FORMAL TRAINING PROGRAMS AND CONFERENCES ATTENDED BY FNRI STAFF

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Non-Formal Training Programs and Conferences Attended by FNRI Staff

Title	Participants	Date	Organizer
The Road to June 2023: Preparations for Full Implementation of Trans Fat Elimination Policies in the Philippines	RJDumag, KBNacionales, ALEDavid	January 10, 2023	Imagine Law and Food and Drug Administration
National Environmental Health Action Plan (NEHAP) online Sectoral Consultations (Food Safety and Health Sector)	MBugas, Ph.D.	January 24, 2023	National Environmental Health Action Plan
Molecular and Genetic Epidemiology	JSNacis	January 13, 20, 27, 2023; February 3, 2023	Faculty of Medicine, Health, and Life Sciences, University of Maastricht
Philosophy and Ethics of Food Science and Technology	JSNacis	January 19, 26; February 2, 9, 16, 23, 2023	VLAG Graduate School
International Course on Household Food Security for Nutrition Well-being	CJavier, EFerrer	January 23 - February 3, 2023	Food and Agriculture Organization
Introduction To Laboratory Risk Management (LRM)	CJDe Lara, ASan Miguel, JMREspulgar, KCruz, GPulido, AFullbright, VFrancisco, RDayrit	January 27, 2023	Centers for Disease Control Train
APAC customer success hub webinar, Beyond Borders: How to promote interdisciplinary & international collaborative research to contribute to the achievement of the SDGs	MBMisagal	February 1, 2023	Elsevier South East Asia
Introduction to R	JNacis	February 13-14,2023	VLAG Graduate School

Title	Participants	Date	Organizer
Mental Health First Aid	EAArnejo	February 18, 2023	AHA Psychological Training Services
National Institute on Drug Abuse (NIDA) Good Clinical Practice	CJDeLara, ASanMiguel, JMEspulgar, KCruz, GPulido	February 20, 2023	National Institute on Drug Abuse
Introduction To Ergonomics	CJDeLara, ASan Miguel, JMREspulgar, KCruz, GPulido, AFullbright, VFrancisco, RDayrit	February 20, 2023	Oshacademy
The Future of Food Safety: Every JUAN's Responsibility	ERamirez, CAdona, JTagaroma, FPonte, FLGarcia, MAlbao	February 21-22, 2023	PWU - School of Food Science and Technology
Training on the operation of powder vibroscreen	ERamirez, CAdona, JTagaroma, FPonte, FLGarcia, VRamas, CSaldana, CMendoza, JLRamirez	February 21, 2023	GTC Propak Corp
NIDA Clinical Trials Network Good Clinical Practice 6-hr course	GMGironella, GPAzana	February 23, 2023	National Institute on Drug Abuse
Training on the operation of auger type auto packing machine	ERamirez, CAdona, JTagaroma, FPonte, LRamirez	February 23-24, 2023	GTC Propak Corp
NIDA Clinical Trials Network Good Clinical Practice 6-hr course	FSArias	Feb 24, 2023	National Institute on Drug Abuse
NEHAP 2023 General Consultation	MBugas, Ph.D.	Feb. 24, 2023	National Environmental Health Action Plan
NIDA Clinical Trials Network Good Clinical Practice 6-hr course	MSParani	February 28, 2023	National Institute on Drug Abuse
Regional Training Course on Application of Stable Isotope Techniques to Assess Protein Quality of Sustainable Food Sources for Improving Maternal and Child Nutrition in Asia (40 hrs)	CVCabanilla, JBGuilaran	March 6-10, 2023	International Atomic Energy Agency

Title	Participants	Date	Organizer
Hands-on training on the operation of EZ-SX Texture Analyzer	VRamas, CSaldana, JLRamirez, FLGarcia, CMendoza, MAlbao	March 9, 2023	Shimadzu Philippines Corporation
Gut Microbiome Training	MLMadrid, NLCSantos, JPHLabrador, MJGubat, DGDRonquillo, ALPDalisay, JCDTorres	March 13-16, 2023	Duke University
Harvessing the Plasma Proteome for Public Health Application	ACTorres, MSBorlagdan, MNCParungao, BGAblay	March 16, 2023	Mahidol University
Perinconceptional Multiple Micronutrient Supplementation and Early Pregnancy loss: The Jivita-5 Trial in Bangladesh	ACTorres, MSBorlagdan, MNCParungao, BGAblay, CVCabanilla, JBGuilaran, AFPBaquiran, MLTCumagun	March 17, 2023	Mahidol University
NIDA Clinical Trials Network Good Clinical Practice 6-hr course	MOGuirindola, MBMisagal	March 17, 2023	National Institute on Drug Abuse
An Introduction to Good Laboratory Practices	CJDe Lara, ASan Miguel, JMREspulgar,	March 24, 2023	Alison
Basic Life Support (BLS) Certification Course	KCruz, GPulido, AFullbright, VFrancisco, RDayrit	March 24, 2023	Alison
Introduction to Metabolomics Analysis	JNacis	March 28-31, 2023	EMBL's European Bioinformatics Institute
Part 1: Chromatography Concepts for Peptides and Proteins	DMSLeonardo	March 30, 2023	Merck
NIDA Clinical Trials Network Good Clinical Practice 6-hr course	MLDasco	April 11, 2023	National Institute on Drug Abuse
How To Prepare Your Manuscript	MBMisagal	April 15, 2023	Elsevier South East Asia

Title	Participants	Date	Organizer
Critical Thinking and Argumentation	JNacis	April 18, 2023	Wageningen Graduate Schools
Analysis of Milk Powder using ICP-OES with Radial Plasma Observation (1 hour)	JBGuilaran, AMCTungol	April 18, 2023	QES Philippines
Strategies on Personal Growth and Development by US Mission to ASEAN	EABArnejo	April 20, 2023	Young Southeast Asian Leaders Initiative (YSEALI)
Demystifying PRC Requirements for PFT License without Examinations	CMGacias	April 23, 2023	Philippine Association of Food Technologists (PAFT) Inc.
Understanding The Basics Of Electrophoresis (Part 1)	CJDe Lara, ASan Miguel, JMREspulgar,	April 24, 2023	Alison
Understanding The Basics Of Electrophoresis (Part 2)	KCruz, GPulido, AFullbright, VFrancisco, RDayrit	April 24, 2023	Alison
4th Global Conference of the One Planet network's Sustainable Food Systems Transformation	MGuirindola, Ph.D.	April 24-27, 2023	One Planet
How To Write an Abstract and Improve Your Article	MBMisagal	April 29, 2023	Elsevier South East Asia
Seizing Opportunities in Sustainability for Food Industry	JBGuilaran	May 12, 2023	Temasek Polytechnic / BSI
Migration of Method from AAS to ICP-OES in Food Analysis	JBGuilaran, DMSLeonardo, MNGDe Guzman	May 17, 2023	ITS Science Inc.
Workplace Communication Basics	CJDe Lara, ASan Miguel, JMREspulgar,	May 22, 2023	Alison
Workplace Hazards: Noise, Chemicals, Stress, & Violence	KCruz, GPulido, AFullbright, VFrancisco, RDayrit	May 22, 2023	Alison
International workshop on laboratory quality standards towards global competitiveness	ALPadrones; AMCTungol, KBNacionales, REPGuilaran, JCCotara, EGBilledo, ALDavid	May 23-25, 2023	Asia Pacific Food Analysis Network, DOST-FNRI & DOST-ITDI

Title	Participants	Date	Organizer
Value-added and Quality Improvement of Agricultural Products by Fermentation Technology	TTArcangel	June 5-25, 2023	Thailand International Cooperation Agency (TICA) and TESDA Philippines
Technical and Netoworking Workshop on Next Generation Sequencng (NGS) Applications for Probiotics Testing	CESevilla	June 5-9, 2023	Asia - Pacific Economic Cooperatiom (APEC)
Health And Safety Hazards - Hazard Communication	CJDe Lara, ASan Miguel, JMREspulgar,	June 14, 2023	Alison
Health And Safety - Electrical Safety In The Workplace	KCruz, GPulido, AFullbright, VFrancisco, RDayrit	June 14, 2023	Alison
Good Clinical Practice	AMTungol	June 24, 2023	National Institute on Drug Abuse Clinical Trials Network
Training Needs Assessment	GAzaña	June 25-July 1, 2023	Technical Cooperation Council of the Philippines
Occupational Hygiene (Part 1)	CJDe Lara, ASan Miguel, JMREspulgar,	July 14, 2023	Alison
Occupational Hygiene (Part 2)	KCruz, GPulido, AFullbright, VFrancisco, RDayrit	July 14, 2023	Alison
Validation workshop on the Philippine Development Plan of Action for Senior Citizens	CDuante	July 19-21, 2023	National Center for Health Statistics and WHO
Nutri Symposium 2023	Dr. Imelda Angeles-Agdeppa	July 28-31, 2023	Indonesian Nutrition Association
Good Clinical Practice	JAKDumac	July 29, 2023	National Institute on Drug Abuse Clinical Trial Network
FRESH Bi-Annual Meeting Workshop	EGoyena, Ph.D.	August 7-11, 2023	Food and Agriculture Organization

Title	Participants	Date	Organizer
Addressing Food and Nutrition Security in Challenging Times: Experiences in Southeast Asia Countries	MEMisagal, MLManiego	August 8, 2023	Southeast Asia Public Health Nutrition Network
Safe Food Saves Life: Analytical Path to Food Safety	MSBorlagdan REPGuilaran, JCCotara	August 9, 2023	Shimadzu Philippines Corporation
INFOODS Food Composition Data Training	RLVillapaz	August 9-22, 2023	Food and Agriculture Organization and INFOODS
2nd Bi-annual Workshop on Fruit and Vegetables for Sustainable Healthy Diets (FRESH)	IAngeles- Agdeppa, PhD., EGoyena, Ph.D.	August 7-11, 2023	IFPRI-CGIAR
2nd bi-annual Workshop for COGAR Research Initiative on Fruit and vegetables for Sustainable Healthy Diets	EGoyena, Ph.D.	August 7-9, 2023	International Food Policy Research Institute
Risk Assessment & Control - Health & Safety	CJDe Lara, ASan Miguel, JMREspulgar, KCruz, GPulido, AFullbright, VFrancisco, RDayrit	August 11, 2023	Alison
Stress Management - Techniques For Coping With Stress	CJDe Lara, ASan Miguel, JMREspulgar, KCruz, GPulido, AFullbright, VFrancisco, RDayrit	August 11, 2023	Alison
Waters Education Series: LC-MS/MS Method Development Strategies Part 1	MDeGuzman, AMCTungol, JJSLLicayan	August 16, 2023	Waters
Food Safety Summit Manila 2023	CAJGMendoza	August 16, 2023	Glenwood Technologies, Inc.
Sensory Analysis and Shelf Life Testing: An Introduction to Food Product Quality and Longevity Assessment	JBGuilaran, MLTCumagun, MECVergara, MDeGuzman, TCANaniong	August 22, 2023	National Sanitation Foundation
Waters Education Series: LC-MS/MS Method Development Strategies Part 2	JJSLLicayan	August 23, 2023	Waters

Title	Participants	Date	Organizer
Stakeholder Forum: "Breaking the Chains of Double Burden: Empowering Healthier Food Retail to Address Malnutrition"	CVDCabanilla	August 30, 2023	South East Asia Obesogenic Food Environment
SEAOFE Stakeholders Forum on Breaking the Chains of DBM	EAGoyena, Ph.D., CFPatalen	August 30, 2023	South East Asia Obesogenic Food Environment
Solid And Hazardous Waste - Ephoc	CJDe Lara, ASan Miguel, JMREspulgar, KCruz, GPulido, AFullbright, VFrancisco, RDayrit	September 18, 2023	Centers for Disease Control Train
Good Laboratory Practice Recommendations For Biochemical Genetic Testing: Preanalytic Phase	CJDe Lara, ASan Miguel, JMREspulgar, KCruz, GPulido, AFullbright, VFrancisco, RDayrit	September 18, 2023	Centers for Disease Control Train
Technical Cooperation (TC) Fellowship on 13-Carbon Breath Tests and other Isotopic Assays to Assess Gut Health and Related Nutrition Outcomes	AFPBaquiran, MESerafico	October 2-27, 2023	International Atomic Energy Agency
DSWD Enhanced Partnership Against Hunger and Poverty (EPAHP) Program – National Program Management Office (NPMO) and UN-FAO Workshop: Review and Initial Testing of the Updated Digital Mapping System (DMS)	EGoyena, Ph. D.	October 12, 2023	Food and Agriculture Organization
Micronutrient Forum (MNF)	MARRamirez	October 14-23, 2023	Nutrition for Resilience
Micronutrient Forum 6th Global Conference	MGuirindola, Ph.D., EGoyena, PhD	October 16-20, 2023	Nutrition for Resilience
The Food Aid Program in the Philippines during COVID 19 Pandemic and the Recommended Ways Forward	MGuirindola, Ph.D.,	October 16-20 2023	DOST-HRDP (Financial Assistance)
Good Laboratory Practice For Biochemical Genetic Testing	CJDe Lara, ASan Miguel, JMREspulgar, KCruz, GPulido, AFullbright, VFrancisco, RDayrit	October 23, 2023	Centers for Disease Control Train

Title	Participants	Date	Organizer
Productivity In The Workplace	CJDe Lara, ASan Miguel, JMREspulgar, KCruz, GPulido, AFullbright, VFrancisco, RDayrit	October 23, 2023	Alison
Traceability in Food Manufacturing	RLVillapaz	October 25, 2023	Glenwood Technologies International, Inc.
Seoul International Congress on Endocrinology and Metabolism (SICEM) 2023	CPatalen, FPArias, MSParani, PIAmita	October 26-28, 2023	SICEM
Attendance to Meeting on Countering Zoonotic Spillover of High Consequences Pathogens	CESevilla	November 11-13, 2022	INGSA / NASEM
Thermo ScientificTM DeltaTM Q Isotope Ratio Mass Spectrometer with EA IsolinkTM NC/OH & GC Isolink IITM CH - Theoretical Working Principle	JBGuilaran, MLTCumagun, ADSabenecio, MNRDeGuzman, MECVergara	November 15, 2023	ThermoFisher Scientific
Thermo ScientificTM DeltaTM Q Isotope Ratio Mass Spectrometer with EA IsolinkTM NC/OH & GC Isolink IITM CH - Hands-on Training	JBGuilaran, MLTCumagun, ADSabenecio, MNRDeGuzman, MECVergara	November 21-23, 2023	ThermoFisher Scientific
Revisiting Food Fortification: Needs, Impact and Opportunitiees	EABArnejo	November 28, 2023	Philippine Association for the Study of Overweight and Obesity Inc. and International Life Sciences Institute
Training for handling/ offering for transporation of dangerous goods (IATA 1.5)	DGADRonquillo	December 7, 2023	Mayo Clinic
Food Fraud Controls (Vulnerability Assessment Critical Control Point- VACCP)	JCCotara, EGBilledo	December 11, 2023	Lifeline Diagnostic
ISO 19011:2028 Guidelines on Auditing Management Systems	MMuga, FIBJacalan	December 18, 2023	American Society for Quality

FORMAL TRAINING ATTENDED BY DOST-FNRI STAFF

15

Formal Trainings Attended by DOST-FNRI Staff

COMPLETED

Scholars	Division	M/MS/MA/PhD or Graduate Diploma Course	School/ University	Date of Completion
Mildred O. Guirindola	NAMD	PhD in Environmental Science	University of the Phlippines Los Baños	February 6, 2023
Melissa S. Borlagdan	NFRDD	MS Chemistry	De La Salle University Manila	April 22, 2023
Kim Irvin T. Protacio	NAMD	MS in Applied Nutrition	University of the Phlippines Los Baños	August 5, 2023
Maria Julia G. Gubat	NFRDD	PhD in Nutrition cognate in Agricultural Economics	University of the Phlippines Los Baños	August 16, 2023
Salvador R. Serrano	TDSTSD	MS Development Communication	University of the Phlippines Los Baños	August 20, 2023

ON-GOING (INTERNATIONAL)

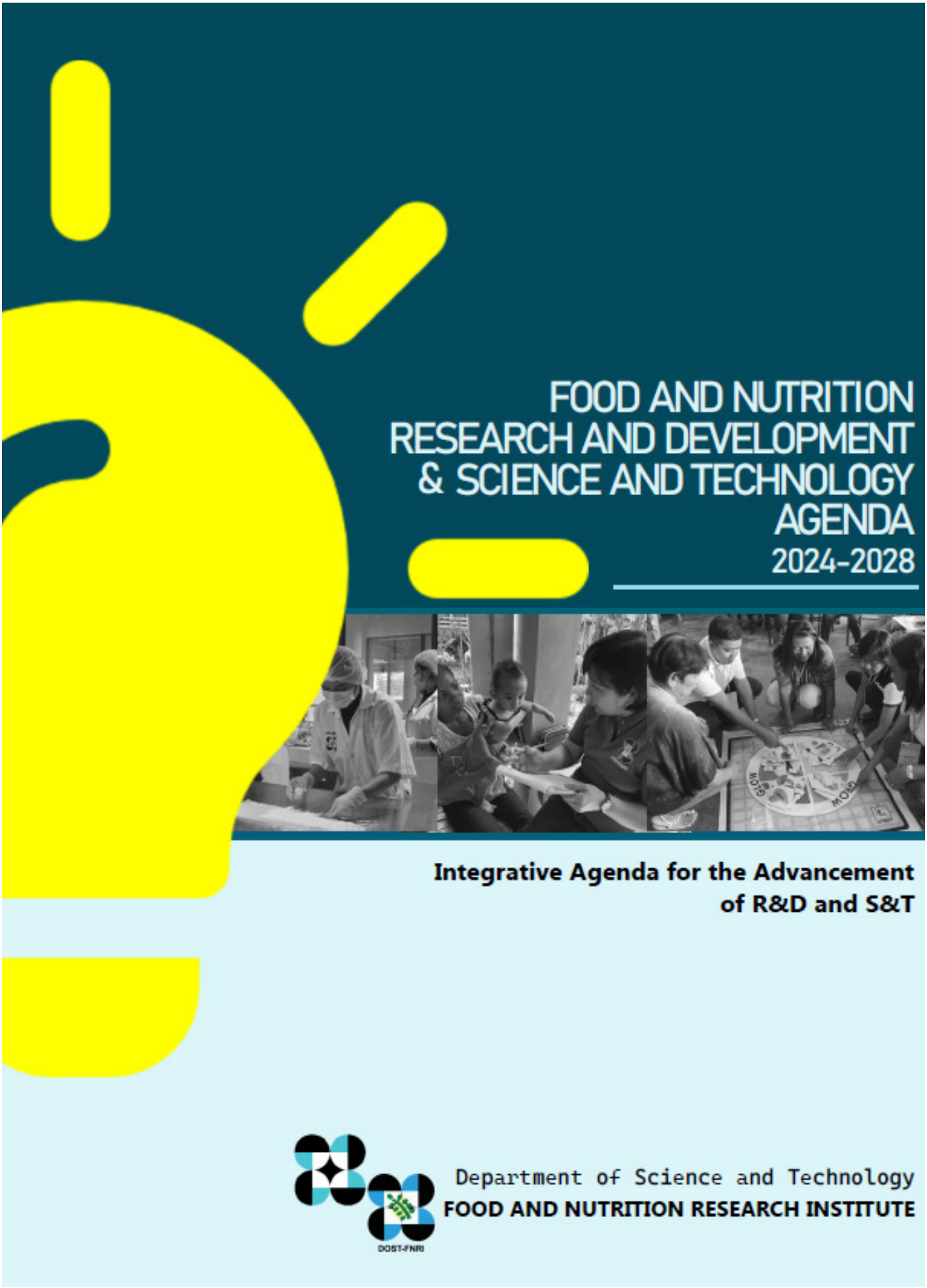
Scholars	Division	M/MS/MA/PhD or Graduate Diploma Course	School/University
Jacus S. Nacis	NFRDD	PhD Sandwich Programme (Nutrition and Health)	Wageningen University and Research (WUR)
Mark Pretel P. Zumaraga	NFRDD	PhD in Life and Health Sciences (Nutrition)	Aix-Marseille University, France
Robby Carlo A. Tan	NFRDD	PhD Sandwich Programme (Nutrition and Health)	Wageningen University and Research (WUR)

ON-GOING (LOCAL)

Scholars	Division	M/MS/MA/PhD or Graduate Diploma Course	School/University
Alex M. Palomo	NFRDD	PhD Food Science	University of the Philippines Los Baños
Claire M. Gacias	NFRDD	HRDP Off Campus Program	Philippine Women's University
Deniesse Abbie A. Caballes	NFRDD	MS Microbiology (Part-time)	University of Santo Tomas, Sampaloc, Manila
Divorah V. Aguila	OD/PEU	PhD Development Studies (Part-time)	University of the Philippines Los Baños
Joanne Jette S. Gulay (self-financed)	NAMD	MS Community Development	University of the Philippines Los Baños
Lea B. Landicho	TDSTSD	NC II (Food Processing)	TESDA
Leah C. Dajay	SL	Public Management Development Program	Development Academy of the Philippines

Future Directions

Future Directions – Integrative Agenda for the Advancement of R&D and S&T



As we stand on the threshold of a new era in food and nutrition, the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) is eager to present its strategic directions and priorities for the coming years. Guided by the overarching theme of the Food and Nutrition Research & Development and Science & Technology Agenda, 2024-2028 "Integrative Agenda for the Advancement of R&D and S&T", the aim to achieve improved and enhanced solutions to address malnutrition is made more pronounced by combining various approaches for a more effective reach within the community. DOST-FNRI is committed to driving innovation, fostering collaboration, and addressing pressing challenges in the field of food and nutrition.

With DOST-FNRI's forward-looking approach to research, technology, and governance, a comprehensive strategy integrating the four (4) Pillars of the Department of Science and Technology (DOST), encompassing the priority mega sectors (financially disadvantaged, individuals with unhealthy lifestyle, older individuals) and the Food & Nutrition Research & Development Strategies, was developed. These strategies attest to DOST-FNRI's dedication to advancing the frontiers of science and promoting evidence-based solutions that improves and enhances the food and nutrition situation of individuals and communities.

The Pillars of the DOST anchor the organization's efforts and initiatives, aligning research priorities, and integrating the strategies and priority mega sectors of DOST-FNRI's research agenda as follows:

1) Human Well-being Promoted: DOST will expedite the development of knowledge, technology, and innovations to ensure health, nutrition, food safety, security, and access to clean water, clothing, and shelter. It will strengthen human resources, infrastructure, and programs to drive science, technology, and innovation (STI) development, enhancing the quality of life for all Filipinos.

- Knowledge Generation: Conducting cutting-edge research in nutritional genomics, food fortification, and functional foods to develop solutions tailored to the needs of the low-income communities, individuals with unhealthy lifestyles, and the older individuals.

- Malnutrition Reduction Initiatives: Developing and implementing targeted nutrition and healthcare interventions, and policy recommendations to enhance the health and nutrition well-being of vulnerable populations.

- Knowledge Diffusion and Technology Transfer: Disseminating research findings and innovative technologies to improve nutritional literacy and community health.

2) Wealth Creation Fostered: DOST will leverage science and technology to develop competitive value-added products and services, boosting high-value jobs, workforce creativity, productivity, continuous product improvement, and the market value of innovations.

- Knowledge Generation: Developing improved and innovative food products and technologies.

- Malnutrition Reduction Initiatives: Constituting a healthier workforce emerging from nutrition interventions, increasing productivity and economic output.

- Knowledge Diffusion and Technology Transfer: Commercializing research products to create economic opportunities and forge industry partnerships.

3) Wealth Protection Reinforced: DOST will lead the efforts to mitigate the impact of natural and human-induced hazards, develop and transfer climate and disaster-resilient technologies, and provide accessible science-based information and services for disaster risk reduction and climate change adaptation.

- Knowledge Generation: Developing improved and innovative food products and technologies for disaster situations.

- Malnutrition Reduction Initiatives: Formulating evidence-based policy recommendations for appropriate disaster-related food aids.

- Knowledge Diffusion and Technology Transfer: Delivering reliable nutritional information to empower healthier and sustainable choices.

4) Sustainability Institutionalized: DOST will enhance efforts to preserve and conserve the resources to address current demands and future needs. It will build on the progress of Science Technology Innovation (STI) investments and pursue digital transformation to create smart, competitive, resilient communities, and transparent, citizen-centric governance systems.

- Knowledge Generation: Integrating sustainable practices in all research activities.

- Malnutrition Reduction Initiatives: Promoting sustainable food development and production, and incorporating sustainable notion in policy statements and recommendations to reduce environmental impact.

- Knowledge Diffusion and Technology Transfer: Adopting sustainable technologies and practices.

- Efficient Governance: Ensuring transparency and accountability in all operations to foster public trust and enhance service quality.

Human capital development is an essential component of all of the pillars listed above in order to get the required results. Thus, effective governance that promotes human capital should be reinforced. Without human capital, governments cannot maintain economic development, will not have a workforce equipped for the future's more highly skilled S&T needs, and will be unable to compete successfully on a global scale. As human capital in research, education, and management grows, so do innovation, social well-being, equality, productivity, and participation rates, all of which contribute to economic development.

For 76 years, the DOST-FNRI has been in the forefront of the fight against malnutrition, providing reliable data and new technology to solve the chronic concerns of hunger and food security. While these challenges persist, albeit in a reduced form, substantial work is still required to attain optimal nutrition for all Filipinos. Armed with an unwavering commitment to advancing food and nutrition research for the benefit of current and future generations, DOST-FNRI is ready to embark on another exciting journey of holistic approach to improve human well-being, foster economic growth, and promote sustainability, while addressing the specific needs of the priority mega sectors. By combining our efforts and implementing these pillars and initiatives, with the help of our partners and stakeholders, we will continue to make important contributions to our society's health and nutritional well-being. ■

List of R&D and S&T Projects for 2023

Outcome 1

R&D Program Addressing Micronutrient Deficiencies

- Development and potential reversal of type 2 diabetes: How critical is vitamin A in the regulation of insulin responsiveness and lipid homeostasis?
- Study on the Challenges of Commercializing Multinutrient Fortified Rice in the Philippines

R&D Program Addressing Macronutrient Deficiencies

- The effects of dietary fiber and other non-digestible carbohydrates in a pre-identified low glycemic index rice and stabilized brown rice on gut microbiota

R&D Program Addressing Normal Nutrition and Nutrition-related Diseases: Nutrition in the Life Cycle Program

- HAPPY Senior Citizen's Program: Relationship of Body Composition to the Functional Capacity and Quality of Life of Older Filipinos in Selected Provinces in the Philippines
- Determination of Energy Expenditures of Infants and Young Children (6-24 months old) in Aisa using the Doubly-Labelled Water (DLW) Technique
- Maternal Nutritional Status and Gestational Weight Gain of Women in Selected Areas in the Philippines: A Pilot Study (formerly Determination of Maternal Nutritional Status and Gestational Weight Gain of Women in Selected Urban and Rural Areas in the Philippines)
- Project on Supporting Adolescent Growth in the Philippines (Project SAGIP): A Pilot Study in Marikina City Phase 2

R&D Program on Food Quality and Safety

- Detection of Salmonella spp in Retailed Eggs and Broiler Chicken using PCR-based assay
- Integrated Program on Food Safety: Project 3. Exposure Assessment of Food Chemical Contamination in Metro Manila: A Pilot Total Diet Study Approach

R&D Program on Development of Tools and Guidelines

- Development of Predictive Models of Low Birthweight among Filipino Pregnant Women: Component 1: Development and validation of predictive models of pregnancy outcome using National Nutrition Surveys: Focus on birthweight
- Development of Predictive Models of Low Birthweight among Filipino Pregnant Women: Component 2: A risk score prediction model for low birth weight using maternal characteristics during pregnancy
- Enhancement of the Philippine Food Composition Tables (PHILFCT®) Online Database and Mobile Application
- Healthy Eats Without the Guilt! Delightful DOST-FNRI Recipes and Tools for Filipinos Managing Hypertension

R&D Program on Food Product Innovation

- Development and Pilot-Scale Production of Nutribunnets and Hard Cookies for School-Based Feeding Programs (SBFPs) and Reformulation of DOST-FNRI-Developed Enhanced Nutribun

Nutritional Assessment and Monitoring Program

Nutrition Survey and Related Studies

- Nutritional Status, Dietary Intake and Health Seeking Behavior of Teenage Pregnant Women in Selected Areas in CALABARZON
- Nutritional Adequacy in Filipino Children and Nutritional Factors Associated with Stunting: Analysis of data from the 2019 National Nutrition Survey
- Snacking patterns of Filipino children and its association to their nutritional status
- The Evaluation of Meal Balance Index among Filipinos: 2018 Expanded National Nutrition Survey Results (formerly MyMenu)

R&D Program on Intervention and Policy Studies

- Project Results to Policy Recommendations (PR to PR): The Link

In-depth and Correlation Studies

- Descriptive Epidemiology of Diabetes and Pre-diabetes in the Philippines in the last two decades
- The Association Between Food Security and Food Costs among Filipino Households
- Association of Individual Dietary Diversity Score and the Nutritional Adequacy of Diet of Filipino Adults
- Dietary Patterns and Its Association to Overweight and Obesity Among Filipino Adults: ENNS 2018-2019
- Association between height and blood pressure among Filipino Adults: Evidences from the Philippine National Nutritional Surveys
- Association of Food Environment Typology, Dietary Intake, and nutritional Status of mothers and children in a peri-urban province during the COVID-19 pandemic
- Comparison of Food Security and Diet Diversity of Households with and without Migrant Parent Workers and Care Practices Provided to their 4–9-Year-Old Children: Exploring their Situation during COVID-19 pandemic (formerly: The Nutritional Status and Dietary Intake of Under-Five Children of Migrant Parent Workers: Exploring their Situation during COVID-19 pandemic)
- Use of food frequency questionnaire to assess relationships between dietary patterns and NCD risk factors: validation with biomarkers
- Assessment of Nutritional and Health Status of Children and Adults Residing in Geographically Isolated and Disadvantaged Areas (GIDA): ENNS, 2018, 2019 & 2021
- Urban and Rural Prevalence and Determinants of Anemia among School-age Children in the Philippines: Evidence from 2018-2019 Expanded National Nutrition Survey
- How prevalent is anemia among Filipino households? An assessment of the hemoglobin level of all household members based on the 2018-2019 ENNS
- Assessment of Selected Risk Factors of Non-Communicable Diseases (NCDs) among School-age Children, Adolescents, and Adults: 2021-2022 ENNS (Data Processing and Analysis) and 2023 NNS (Data Collection)
- Nutritional Status, Feeding Practices and Food Intake of 6-9 years old Children in Muntinlupa City (formerly: Evaluation of consumption of enhanced bread on the Vitamin A, Iron and anthropometric status and dietary intake of 6-9 years old schoolchildren)

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
- 2023 FNRI Seminar Series
- Multimedia nutrition promotion (media mileage)

Strengthen Industry- Academe Government and International STI Collaborations

- 2023 Contract Researches and Other Collaborative Projects on Food and Nutrition

Upgrade STI facilities and capacities to improve S&T Services

- Maintaining integrity in Food and Nutrition R&D through responsible conduct of researches involving human participants
- Mainstreaming Gender and Development (GAD) concerns in the Institute: A continuing commitment of the DOST-FNRI Gender Focal Point System (GFPS)
- ISO
- On-the-job Training
- In-house training organized and attended by FNRI Staff
- 2023 Scientific Linkages and International Cooperation
- Scientific Papers Published
- Journal Citations
- Scientific Paper Presented
- Poster Presentation
- Technical Trainings
- Technical Trainings on DOST-PINOY
- Technical Trainings on National Nutrition Survey
- 2023 AWARDS

Financial and Human Resource Management

- Expenditure by Expense Class 2023
- Expenditure by Program Expenditure Classification (PREXC) 2023
- Resource Generation
- Non-Formal Training Programs and Conferences Attended by FNRI Staff
- Formal Training Attended by DOST-FNRI Staff

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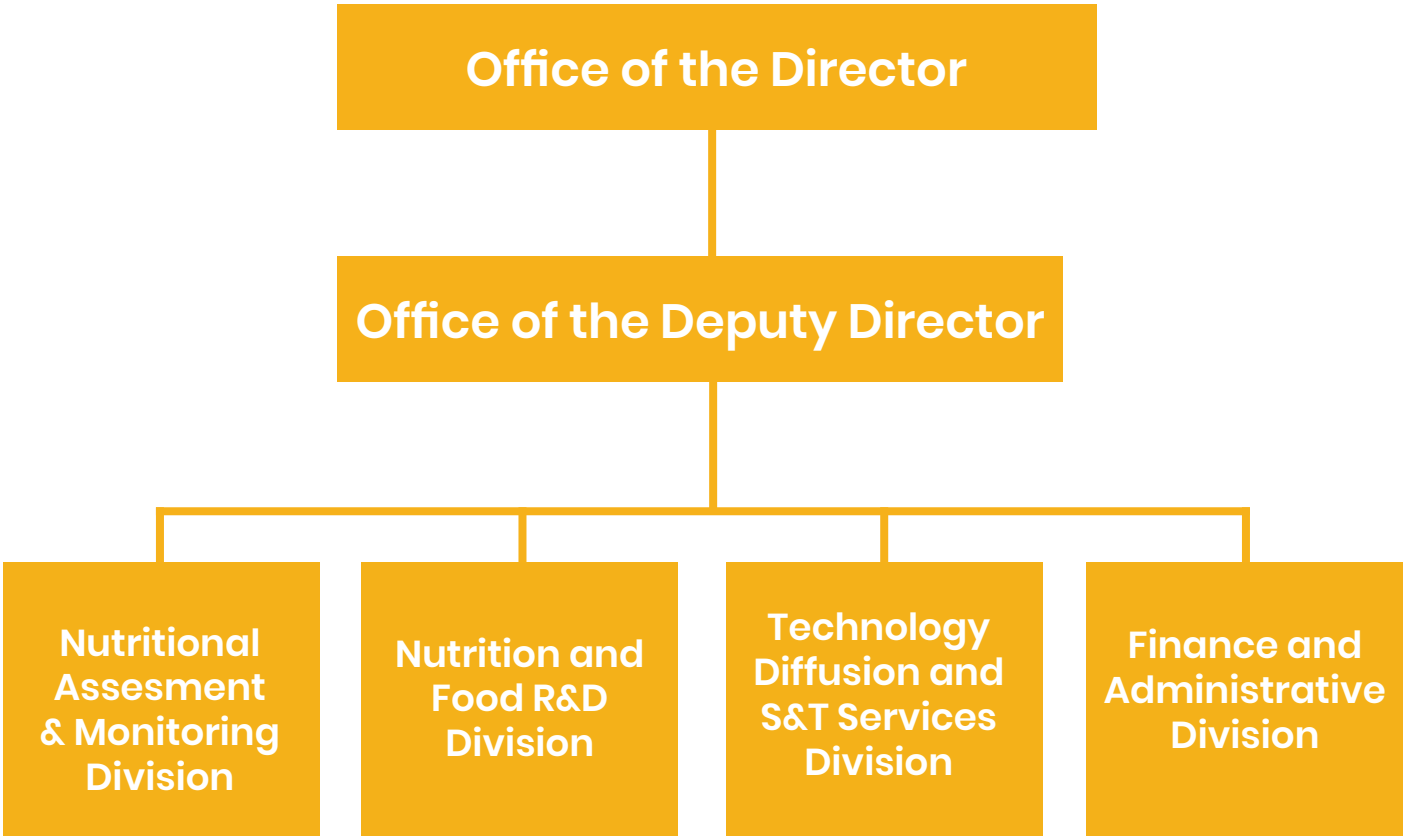
Organizational Structure



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