



**World Food
Programme**

WFP STUDY ON IRON RICE FORTIFICATION CAPACITIES, SUPPLY CHAIN AND CAMPAIGN INITIATIVES IN THE PHILIPPINES

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**WFP STUDY ON IRON RICE FORTIFICATION CAPACITIES, SUPPLY CHAIN
AND CAMPAIGN INITIATIVES IN THE PHILIPPINES (WFP/PH/RFP/006/2022)**

by

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List of Acronyms

AHMP	Accelerated Hunger Mitigation Program
BangUn	Bangsamoro Umpungan sa Nutrisyon
BARMM	Bangsamoro Autonomous Region in Muslim Mindanao
CEST	Community Empowerment for Science and Technology
DepEd	Department of Education
DO	Department Order
DOH	Department of Health
DSWD	Department of Social Welfare and Development
DSWD-DRMB	DSWD-Disaster Response Management Bureau
DSWD-NRLMB	DSWD-National Resource and Logistics Management Bureau
DSWD-PMB	DSWD-Program Management Bureau
DTI	Department of Trade and Industry
EPAHP	Enhanced Partnership Against Hunger and Poverty
FDA	Food and Drug Administration
FGD	Focus group discussions
FNG	Fill the Nutrient Gap Philippines
FNRI	Food and Nutrition Research Institute
FSP	Food for School Program
GIA	Grants-in-Aid
IATF-ZH	Inter-Agency Task Force Zero Hunger
IEC	Information, education and communication
IFR	Iron-fortified rice
IRK	Iron-rice kernel
KII	Key informant interviews
LGU	Local government unit
MBHTE	Ministry of Basic, Higher and Technical Education
MOA	Memorandum of agreement
MOST	Ministry of Science and Technology
MSMEs	Micro, small, and medium enterprises
NBC	Nutrition and Beyond Corporation
NCR	National Capital Region
NFA	National Food Authority
NFMC	Nutridense Food Manufacturing Corporation
NGO	Non-government organization
NNC	National Nutrition Council
NNC-GB	National Nutrition Council Governing Board

PPAN	Philippine Plan of Action for Nutrition
PhilRice	Philippine Rice Research Institute
RA	Republic Act
SBFP	School-based Feeding Program
SETUP	Small Enterprises Technology Upgrading Program
SFP	Supplementary Feeding Program
SMS	Short messaging service
SPS	Sangkap Pinoy Seal
SSNP	Social safety net program
SY	School Year
S&T	Science and technology
TAPI	Technology Application and Promotion Institute
TLA	Technology Licensing Agreement
TWG	Technical working group
UNICEF	United Nations International Children's Fund
WFP	World Food Programme
WHO	World Health Organization
4Ps	Pantawid Pamilyang Pilipino Program

Executive Summary

Introduction. The Philippines has been implementing mandatory rice fortification with iron with the passage of Republic Act (RA) 8976 or the Philippine Food Fortification Act on 7 November 2000 with full implementation in 2004.

In 2005, the Food for School Program (FSP) of the Accelerated Hunger Mitigation Program used iron fortified rice (IFR) with iron-rice kernel (IRK) coated with ferrous sulfate. The FSP involved the provision of a kilo of rice to Grade 1 and preschool children enrolled in identified public elementary schools; and all children 3-4 years old in identified DSWD-supervised day care centers. The National Food Authority (NFA) provided the IFR requirements of the program up to early 2010.

In addition, IFR was served in food service establishments in Davao City based on an executive order by then Mayor and now President Rodrigo Roa Duterte in 2007. It was also during this time that the Food and Nutrition Research Institute (FNRI) was developing hot extrusion technology with micronized ferric pyrophosphate as fortificant and blenders. FNRI started transferring the technology in 2013 resulting in localized rice fortification activities in Orion, Bataan and the provinces of Zambales and Davao de Oro, without much success except in Davao de Oro.

In 2014, the Philippine delegation participating the workshop on Scaling Up Rice Fortification in Asia agreed to initially focus rice fortification on social safety net programs. This was in recognition of the need to ensure access of the more vulnerable to IFR in the context of the challenge of fortifying the volume of rice consumed in the Philippines (about 10.2 MT).

In 2018, RA 11037 on mandatory feeding of malnourished children in public elementary schools and child development centers (formerly called day care centers) was passed. Among others, the law institutionalized the use of fortified foods in these feeding programs.

In 2019, the World Food Programme (WFP) conducted a pilot study on the use of IFR in the school feeding program in Maguindanao Province. The IFR was produced using local IRK from Pangasinan Province, local rice and the blending facilities of NFA. The pilot study demonstrated successfully that IFR with rice from local farmers can be used in school feeding programs.

In 2020, President Duterte issued an executive order organizing the Inter-Agency Task Force on Zero Hunger (IATF-ZH) headed by the Cabinet Secretary. Several meetings of the IATF-ZH and conduct of two (2) *Kumain* (literally means to eat) webinars among cooperatives and government agencies in 2021 resulted to a surge in rice fortification activities, with support from the Department of Science and Technology (DOST) that increased producers of IFR and purchase of IFR by the Department of Education (DepEd).

It is in this context that WFP Philippines, with support from Japan-based partners from WFP, International Life Sciences Institute and DSM, decided to conduct a study on the overall rice fortification capacities, supply chain, and campaign initiatives in the Philippines.

Objectives

Overall objective. The study aimed to determine supply chain, advocacy, and campaign gaps that could explain the low supply, acceptance, and consumption of iron-fortified rice.

Specific objectives were to map iron-rice fortification capacities and campaign initiatives of the Philippines, and to identify the supply chain issues that hinder the implementation of mandatory rice fortification as stipulated in RA 8976.

Expected output include recommendations along:

1. Most cost-effective and efficient delivery of IFR to target recipients;
2. Strategies for the increased consumption of IFR through social safety net programs, and commercialization on the supply side, i.e., IRK suppliers and IFR producers through rice millers, distributors and retailers and involving local farmers and communities for access to the technology for the production of IFR; and
3. Communication strategies for increased knowledge and acceptance of IFR by consumers, local officials, non-government organizations, and other stakeholders.

Methodology. The study involved a desk review of previous researches and activities on rice fortification. Key informant interviews (KIIs) and focus group discussions (FGDs) were done covering stakeholders based on a framework on the ecosystem of rice fortification. KIIs covered 7 producers of iron-rice kernels, 11 iron fortified rice producers, 4 machine fabricators and importers, 4 farmers cooperatives and a rice mill in BARMM, representatives of 4 agencies involved in social safety net programs (feeding programs and disaster response), representatives from DOST at national and regional levels, and representatives of 4 government agencies or organizations in BARMM. The results of the desk review, KIIs, and FGDs were analyzed as basis for the recommendations for rice fortification.

Results and discussion. Current IFR production capacity is 181,440 MTs/year or only 1.81% of the fortifiable rice of 10.2 million MT.

An analysis of the supply of IFR vs demand from feeding programs of the DepEd and the Department of Social Welfare and Development (DSWD) shows the presence of the capacity to produce up to 181,440 MT of IFR, more than three times higher than the 55,233 MT of IFR needed by DepEd and DSWD.

The maximum capacity to produce IRK is 1,359.36 MT, almost 5 times higher than the IRK needed to produce the IFR for DepEd and DSWD programs.

Currently, there are 2 producers of IRK and 2 importers of IRK and multi nutrient rice kernels. Two more IRK producers are expected once their production facility is operational by the end of 2022. There are 10 producers of IFR while an additional 8 producers of IFR will be operating by the end of 2023. Most of these IFR producers are in Luzon. DOST and FNRI provided financial and technical support, respectively to most IFR producers. NFA started pilot testing of the production of IFR in 4 regions with a target of full production of 50% (150,000 MTs) of its buffer stocks by 2023. In addition, 25 potential IFR producers have requested FNRI for technical support. These requests are being evaluated. Given this scenario, production of IFR is expected to increase substantially in 2022-2023 and would be more than enough to supply IFR to the feeding programs of DepEd and DSWD. However, based on the mapping of producers of IFR, currently there are no producers in the Visayas and 2 in Mindanao. This presents supply chain concerns especially along the cost of distribution for the use of IFR in these areas.

According to the producers, there is an additional cost of P4 due to fortification. A little more than half (about P1.88 to P2.25/kg of rice) of this additional cost is contributed by IRK, (locally priced at P375 – P450/kg). An IFR producer estimates the cost of blending at P65/50 kg or P1.30/kg. However, NFA's cost of blending is only at P35/50 kg or 0.70/kg. Another element of the cost of fortification is FNRI's royalty fee for technology adoption, which is 2% of total sales.

Distribution and logistics is a significant factor to consider in the supply chain of IFR since most of the IRK and IFR producers are in the island group of Luzon. Transporting IFR or IRK from Luzon to the Visayas and Mindanao can add P2-5/kg more in addition to the cost of fortification. Thus, the FNRI evaluation of requests for technology adoption should consider the lack of IRK and IFR producers in the Visayas and Mindanao island groups.

Other supply chain concerns are on the fortification of imported rice and quality monitoring of IFR producers as the regulatory function of NFA in the rice industry has been discontinued through RA 11203 or the Rice Tariffication Law. These issues have not yet been resolved.

Advocacy and communications campaigns on IFR were more localized, while current advocacy efforts at the national level are focused on the production of IFR. Advocacy and promotion of IFR in Region 1 and Davao de Oro could be considered as models that can be replicated in other regions and provinces. A communication plan to promote IFR was formulated in 2016 but was not implemented. In addition, various information education and communication materials targeting local government units and consumers were developed in 2018 but were not used due to issues on the supply of IFR.

The main source of information of consumers on nutrition and rice fortification is television, health centers and social media.

Conclusions and recommendations:

The Philippines has the capacity to fortify rice for the requirements of mandatory feeding programs in public elementary schools and child development centers. However, this capacity exceeds the requirements of mandatory feeding programs. Furthermore, the capacity to produce IFR is relatively weak in the Visayas and Mindanao since most of the IRK and IFR producers are in the Luzon regions.

For more cost-effective and efficient distribution the first recommendation is to reduce the cost of fortification by half by 1) considering alternative and less costly sources of micronized pyrophosphate, 2) reducing the cost of blending, and 3) revising the FNRI royalty fee requirement. The resulting cost is within consumer affordability based on the results of the FGDs.

In addition, the guiding principle of bringing the sites of production of both IRK and IFR closer to each other is recommended to be adopted. DOST and FNRI being primary supporters of IFR production are key gatekeepers in this regard, and a focus should be the Visayas and Mindanao. Continued use of an acidic compound is likewise recommended together with efforts to ensure quality fortification.

To increase consumption of IFR, market expansion is recommended to cover 1) social safety net programs of non-government organizations, government institutions that use rice like hospitals and jails, private companies that give rice allowance to their employees, and 2) commercial market. In addition, relevant policies on the use of IFR from national government agencies like the Departments

of Health, the Interior and Local Government, Labor and Employment and local government units (in the form of local ordinances or laws) are recommended to be issued and implemented.

To increase the demand for IFR, an advocacy and communication plan can be formulated and implemented to assist local producers on how best to distribute IFR targeting national, local government, and non-government organizations that can use IFR, as well as consumers. Experiences in Region 1 and Davao de Oro could be shared for adaptation by other regions and LGUs. *KUMAIN* webinars of the IATF-ZH and DOST regional seminars could continue to be implemented to increase the supply and demand for IFR. To reach out to consumers to use IFR, social media channels and bulk text messaging could be used together. Existing interpersonal communication channels can be tapped, e.g., the nutrition education component of the *Tutok Kainan* Program of the National Nutrition Council (NNC), family development sessions of the *Pantawid Pamilyang Pilipino* Program (4Ps) and parents effectiveness sessions of the DSWD, parent-teacher association orientations and meetings. The 2016-developed communication plan can be a starting point for this effort.

Finally, given the number of recommendations provided in the report, the next step would be the development of an interagency strategic and operational plan that will become the basis for the funding and implementation of the Philippine Rice Fortification Program which can be initiated by IATF-ZH and NNC and advocated as a priority program of the next administration.

1.0 Introduction and rationale

The Philippines enacted Republic Act (RA) 8976, An Act Establishing the Philippine Food Fortification Program and Other Purposes in 2000, with full implementation of mandatory fortification by 2004. RA 8976 mandates fortification of milled rice with iron, wheat flour with vitamin A and iron, cooking oil with vitamin A and refined sugar with vitamin A. It also provides for voluntary fortification of processed food with vitamin A, iron, and iodine using the *Sangkap Pinoy* Seal (SPS) as the main communications handle.

Since 2004, the law has not been fully implemented due to various issues and concerns. Rice fortification was implemented sporadically. Local wheat flour and labeled vegetable and palm cooking oil have been fortified but compliance to fortification levels needs to be determined. Imported flour, and unlabeled cooking oil sold in transparent packaging with about 65% market share are not fortified, while refined sugar has never been fortified.

Even with these setbacks, micronutrient deficiencies, including anemia prevalence, have improved starting in 2008 or after full implementation of RA 8976 (Figure 1). The decline in anemia prevalence continued until 2019, with a slight increase between 2013 and 2018.

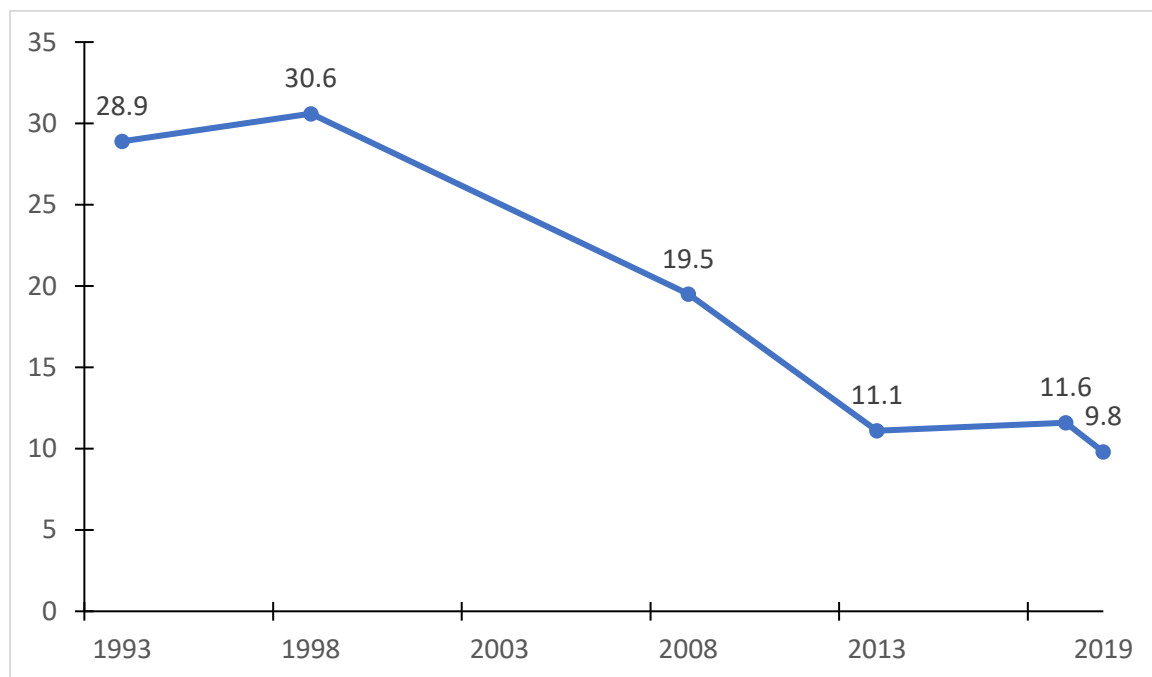


Figure 1. Trends in anemia prevalence in the Philippines, 1998 to 2013 (Food and Nutrition Research Institute (FNRI), National Nutrition Survey)

The decline in anemia prevalence between 1998 and 2018 and 2019 was evident across all age and population groups (Figure 2). Based on World Health Organization (WHO) cut-off for public health significance for anemia, the prevalence among almost all age / population groups are indicative of a mild problem except for the age group 6 – 11 mos. old and one-year old for which anemia is of a moderate level.

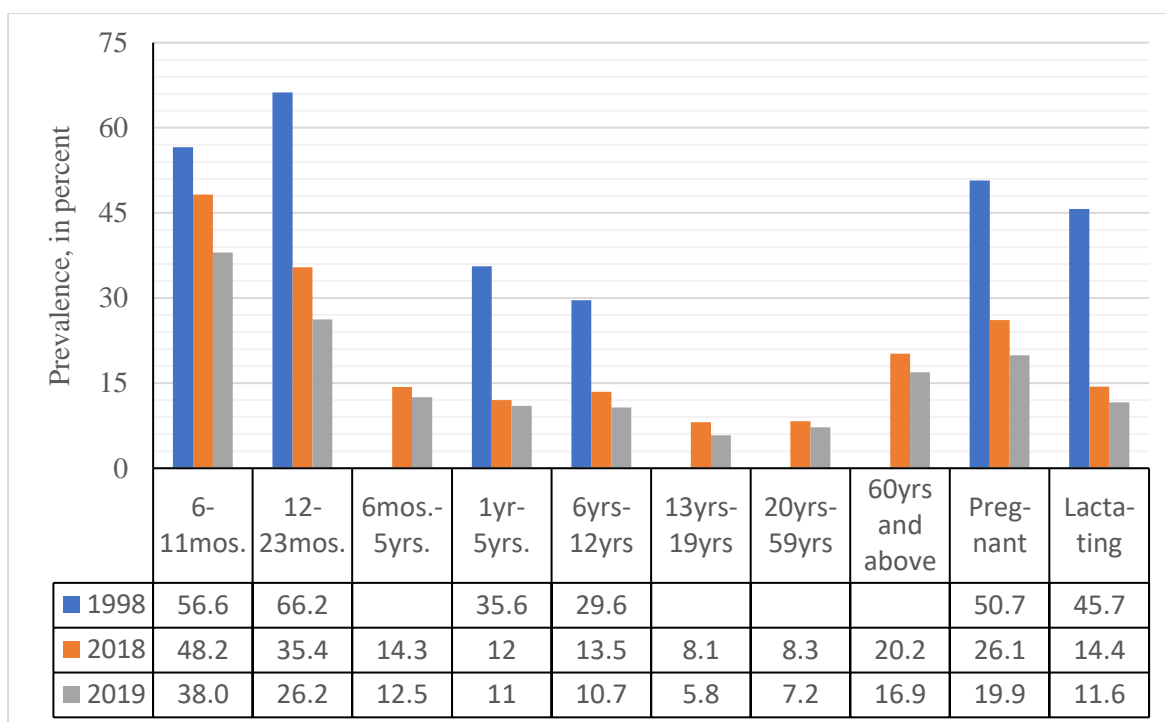


Figure 2. Anemia prevalence among various age and population groups 2018 and 2019. (FNRI, National Nutrition Survey 2019)

Since reestablishing its presence in the Philippines in 2006, World Food Programme (WFP) has focused its technical assistance in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) as it ranks lowest in human development due to internal conflict and insecurity resulting in restricted access to basic social services. In 2018, the WFP conducted a study entitled the “Fill the Nutrient Gap (FNG): Philippines”, a nutrition analysis framework and decision tool.

Table 1 is the summary of the results of the FNG study that shows the factors affecting malnutrition particularly in its project area of BARMM as compared to other regions.

Table 1. Factors affecting malnutrition in BARMM.

Indicator	Results for BARMM	Ranking	Result for lowest/highest ranking region	Remarks for BARMM
Stunting (Among children under-five years old)	45%	1	23% (Region 3) – lowest prevalence	Highest prevalence among regions
Median daily household food expenditure (Rural)	P154	2	P151 (Region 10) – lowest expenditure	2 nd lowest expenditure
Median daily household food expenditure (Urban)	P155	1	P370 (National Capital Region [NCR]) -highest expenditure	Lowest expenditure
Daily cost of energy-only diet	P120	2	P133 (NCR) – highest cost	2 nd highest daily cost

Indicator	Results for BARMM	Ranking	Result for lowest/highest ranking region	Remarks for BARMM
Percentage of households that would not be able to afford energy-only diet	23%	1	NCR lowest at 0% - lowest percentage	Highest among all regions
Daily cost of a nutritious diet	P 165.00	4	P 148.00 (Region 5) – lowest	4 th lowest daily cost of nutritious diet
Relationship between daily cost and non-affordability of a nutritious diet by region	58%	2	59% (Region 10) – lowest	2 nd lowest daily cost

Part of the WFP technical assistance is the conduct of school feeding based on Department of Education (DepEd) Department Order (DO) 39, S. 2017 – Operational Guidelines on the Implementation of School-based Feeding Program for School Year 2017-2022.

RA 11037, An Act Institutionalizing a National Feeding Program for Undernourished Children in Public Day Care, Kindergarten and Elementary Schools to Combat Hunger and Undernutrition among Filipino Children and Appropriating Funds Therefor institutionalized feeding programs in public elementary schools and child development centers (formerly called day care centers). The law encourages the use of iron-fortified rice (IFR) in feeding programs as also provided in RA 8976. However, the use of IFR in school feeding has been limited to a few areas that were supported by local government units (LGUs) in Pangasinan and Davao de Oro Provinces prior to the enactment of RA 11037.

It is in this context that WFP conducted a pilot study on the use of IFR for school feeding in Maguindanao Province, results of which were documented and presented to various stakeholders, particularly with the government’s Interagency Task Force on Zero Hunger (IATF-ZH) headed by the Cabinet Secretary.

As a follow-up to the successful pilot study, WFP is undertaking this study on iron rice fortification capacities, supply chain and campaign initiatives in the Philippines. The results of this research can hopefully be used to expand rice fortification not only in BARMM but also nationwide.

2.0 Progress of rice fortification in the Philippines

Rice fortification has long been a strategy in the Philippines to address micronutrient malnutrition with the successful efficacy testing in 1946 with the addition of thiamine to address the problem of beri-beri as well as niacin and iron using a technology from Hoffman LaRoche. The research was pioneered by the then Secretary of Health, Dr. Juan Salcedo, Jr., the founder of the Nutrition Foundation of the Philippines, Inc. To ensure the eradication of beri-beri, the Philippines enacted the Rice Enrichment Law in 1952 but since the law was used as basis for taxation, it eventually was not implemented, but by the end of the 1950s, beri-beri was eradicated.

The success of the aforementioned rice fortification initiative was the basis for the continued research by the Food and Nutrition Research Institute (FNRI) of the Department of Science and Technology (DOST) on iron fortification of rice in the 1980s and 1990s.

At that time, ordinary rice was coated with iron to produce the iron-rice kernel (IRK), which was mixed with milled rice to produce IFR. Based on this technology, RA 8976 was enacted. The law's implementing rules and regulations (IRR) mandated the iron fortification of rice at 6 to 9 milligrams (mgs) of iron/100 grams of milled rice.

This technology was used in the iron fortification of rice for the Food for School Program (FSP) of the Accelerated Hunger Mitigation Program (AHMP). The FSP involved the provision of a kilo of rice to Grade 1 and preschool children enrolled in identified public elementary schools; and all preschoolers 3-4 years old in identified day care centers supervised by the Department of Social Welfare and Development (DSWD). The National Food Authority (NFA) provided the IFR, which was either imported from Vietnam or locally-produced rice with coated IRK using ferrous sulfate from the Wright Group from USA. This was done from 2005 to 2010 by NFA.

From 2011-2013, NFA conducted a major communications campaign for the distribution of IFR through commercial outlets primarily to mop up its supply of IFR. When the supply of IFR ran out, the commercial distribution was also discontinued.

In 2007, one of the LGUs that initiated rice fortification was Davao City when then Davao City Mayor and now President Rodrigo Roa Duterte issued Executive Order No. 19 that established the Davao City Monitoring Task Force with a budget of P500,000. The task force monitored food service establishments on the use of iodized salt and IFR. Advocacy activities were conducted in malls among health workers resulting in the serving of IFR in major fastfood outlets such as Jollibee, Chowking, McDonalds. METAVCO Rice Mill produced IFR using coated IRK from CLG Foods, with Grains Fortificant Marketing as distributor. However, following the change in local leadership in 2010, no funds were provided for the task force and the program was discontinued.

In 2002, FNRI started developing hot extrusion technology for the production of IRK through which the iron was imbedded in the kernel instead of being coated. Using extruded IRK for IFR resulted to a minimum of 90% retention of iron, much higher than the estimated 50% iron retention for the coated technology. (The loss in iron was due to the practice of washing rice prior to cooking.) Superlative Snacks Corporation adopted the technology in 2006 and in 2007 Goldilocks Corporation, a major fastfood chain, used IFR in its rice meals. Also in 2006, FNRI conducted a market trial of IFR commercialization in Orion, Bataan with support of an ordinance and a communications campaign. This was implemented on a bigger scale in Zambales Province with the commercialization of IFR in one city and seven municipalities complete with a communication campaign using television, launching events, parades, billboards and information, education and communication (IEC) materials. Following the changes in administration, these initiatives in Orion and Zambales were discontinued. At about the same time, there was a significant decrease in anemia among Filipinos as shown in Figure 1.

In 2014, during the workshop on Scaling Up Rice Fortification in Asia, the Philippine delegation composed of representatives from government agencies (DSWD, FNRI, Food and Drug Administration (FDA), National Nutrition Council (NNC), NFA), UNICEF, WFP, and rice millers and traders (Nutridense Food Manufacturing Company, Nutrition and Beyond Corporation, Philippine Confederation of Grains) decided to pursue rice fortification, initially, for social safety net programs (SSNPs).

This decision recognized that fortifying all the rice supply in the Philippines would be challenging given the volumes involved.

Based on the data of the Philippine Statistics Authority, in 2018, the average annual per capita consumption was 103.25 kg. and with an estimated 110 million population, estimated total rice intake is 11,375.5 million tons at 70% for commercial use, about 8 million metric tons are needed to be fortified under mandatory fortification of rice. This would be difficult to achieve given the number of rice millers that should do rice fortification. As such, focusing the distribution of IFR to the more needy vulnerable groups who are usually covered by SSNPs translates to a volume of rice for fortification that can be controlled and monitored.

2.1 *Studies to revive rice fortification*

Following the end of the AHMP in 2010 and the NFA IFR commercial distribution in 2013, various studies were conducted to revive rice fortification, while FNRI started the transfer of technology on the local production of extruded IRK (currently the technology used for local production of IRK), and rice fortification with its blending machines. These studies, managed by NNC, were as follows:

- 2.1.1 **“Rice Supply Chain Diagnostic in the Philippines”**, 2014, supported by UNICEF and the Food Fortification Initiative. The study looked into the rice supply chain and experiences related to rice fortification to determine how rice fortification can be scaled up. This led the NNC to organize the ad hoc technical working group (TWG) on rice fortification. Based on the findings of the study, the TWG, agreed to focus rice fortification on rice distributed through the government’s SSNPs and developed a workplan for this purpose.
- 2.1.2 **“Rice Consumption for SSNPs of the Government of the Philippines and Non-Government Organizations”**, 2015-2016, supported by UNICEF. This was a follow-up technical assistance project for the scale up of rice fortification in the Philippines. The study identified various SSNPs particularly of the DepEd and DSWD, estimated the cost of using IFR in their feeding programs, identified sources of IFR, and showed models of rice fortification for SSNPs for implementation by LGUs. The study was used to conduct advocacy activities in regions with sources of IFR. A communications plan to promote rice fortification for SSNP was also formulated.
- 2.1.3 **“Technical assistance on rice fortification for SSNPs”**, 2017-2018, supported by Nutrition International. This initiative involved various activities, as follows:
 - 2.1.3.1 Conduct of a landscape policy analysis of rice fortification for SSNPs;
 - 2.1.3.2 Documentation of best practices on LGU implementation of rice fortification in Davao de Oro and Urdaneta City;
 - 2.1.3.3 Development of a national policy guidance for government agencies involved in rice fortification for SSNPs;
 - 2.1.3.4 Development of mechanisms for production, supply and distribution of IFR within SSNPs;

- 2.1.3.5 Formulation of an NNC Governing Board resolution in support of rice fortification (approved in 2019); and
- 2.1.3.6 Development of IEC materials to advocate for rice fortification for SSNPs, targeting local chief executives and consumers.

2.2 *Major policy and program developments, 2019 to present*

Following the conduct of the aforementioned studies and continued advocacy for the use of IFR in the feeding programs of DepEd and DSWD as well as models of implementation of school feeding using IFR in Davao de Oro and Urdaneta City as identified in the aforementioned reports, the following were major policy and program developments in increasing the production and consumption of IFR:

- 2.2.1 **Passage of RA 11037**, An Act Institutionalizing a National Feeding Program for Undernourished Children in Public Day Care, Kindergarten and Elementary Schools to Combat Hunger and Undernutrition among Filipino Children and Appropriating Funds Therefor or the *Masustansyang Pagkain para sa Batang Pilipino Act* (Nutritious Food for Pilipino Children). The law, passed on 24 July 2017, encourages the use of IFR in the school feeding program of DepEd for malnourished schoolchildren and for all pre-school children in child development centers of DSWD.

In response to RA 11037, DepEd and DSWD, which were already implementing feeding programs even prior to the law, developed guidelines to ensure its implementation and at the same time encourage the use of IFR.

- 2.2.2 **Adoption of the policy on use of IFR in SSNPs through National Nutrition Council Governing Board Resolution No. 1, S. 2019**, “Scaling Rice Fortification with Iron for Social Safety Net Programs in the Philippines” (Annex 1).
- 2.2.3 **Adoption of the Enhanced Partnership Against Hunger and Poverty (EPAHP)** through the signing of a Memorandum of Understanding among 14 national government agencies, 10 attached agencies of the 14 national government agencies, and 2 government banks in 2019. Among others, the partnership aims to increase farm productivity and income, ensure food security and nutrition, and mitigate hunger and malnutrition. Among others, its strategic measures include tapping community-based organizations as suppliers of the food requirements of supplementary feeding programs and capacitating these organizations so that they can supply the food requirements of supplementary feeding programs. Capacitation involves the adoption of policies and processes that will allow increased access to credit facilities and increased ability to participate in community-based procurement, and the provision of farm technologies and extension services.
- 2.2.4 **Organization of the Inter Agency Task Force on Zero Hunger (IATF-ZH)**, through Executive Order 101 by President Rodrigo Duterte in 2020. The IATF-ZH is headed by the Cabinet Secretary. The IATF-ZH aims to end hunger by 2030, in line with the United Nations Sustainable Development Goal No. 2 through the adoption and implementation of the National Food Policy.

The National Food Policy covers six key result areas, namely *a)* review and rationalize existing policies, rules, and regulations related to zero hunger; *b)* ensure available and affordable food; *c)* secure nutrition adequacy; *d)* secure food accessibility and safety; *e)* ensure sustainable food systems, food resiliency, and stability; and *f)* ensure information, education, awareness, and people participation. Accomplishments reported by member agencies in December 2021 were as follows:

- 2.2.4.1 Procurement of IFR for the DepEd School-based Feeding Program (SBFP) amounting to P 85,640,857.81. DepEd district offices mainly in Luzon were involved although two cities in Mindanao (Mati City and Digos City) were waiting for the confirmation of their orders. It was noted though the price range of IFR was P60 to 90 per kg mainly due to transport costs.
- 2.2.4.2 Conduct of the WFP pilot study on the use of IFR in school feeding in Maguindanao. The study showed the feasibility of producing IFR in BARMM using facilities of NFA and rice from local farmers with IRK from Nutridense Food Manufacturing Corporation based in Pangasinan province.
- 2.2.4.3 Revision of the standards for IRK with the issuance of FDA Bureau Circular 2007-0010A (Annex 2). When the 2019 WFP study was being conducted, the standard used for the production of IFR was 60 to 90 ppm iron as provided by RA 8976 and its IRR. This was based on the coating technology for the production of IRK that was the only technology available at the time the law was enacted. However, FNRI has developed and tested successfully the use of the hot extrusion technology for IRK production with minimal loss of iron and with more acceptable sensory and physical characteristics of IFR compared to IFR produced using the coating technology. Various meetings were held to review the proposed revised standards for IRK given the FNRI researches. Following a meeting of the IATF-ZH on 20 December 2021, the Department of Health (DOH) assured the approval of the revised standard which was eventually issued the following day on 21 December 2021.

The standard for the iron content of IFR was lowered from 60 ppm - 90 ppm iron to 20 ppm – 60 ppm iron.
- 2.2.4.4 Development of an NFA workplan for rice fortification for 2022, implementation of which started with the procurement of four blending machines for the pilot production of IFR for NCR and Regions 2, 3, and 4-A. NFA targets to eventually fortify 50% of its rice buffer stocks starting with its pilot study in 2022. It was able to source the budgetary requirements of its pilot IFR production in 2022 and would include the fortification of 50% of its buffer stocks in its 2023 annual budget proposal.
- 2.2.4.5 Conduct of the *1st Kumain* (literally means to eat) Webinar in August 2021 organized by the IATF-ZH, that may have triggered the increase in

the number of producers and potential producers of IFR particularly through the DOST Community Empowerment for Science and Technology (CEST) Program. A follow-up *Kumain* webinar was held last 25 January 2022. Please see related discussions in Section 5.0.

- 2.2.4.6 Implementation of NNC's dietary supplementation program called *Tutok Kainan* (means targeted feeding) that has reported to have procured 127,999 kgs of IFR for pregnant women and children 6 to 23 months old.
- 2.2.4.7 Commitment of DOH to issue a policy for all DOH hospitals, canteens, programs and projects to use only IFR and to design and implement a communications campaign for IFR.
- 2.2.4.8 Ongoing and about-to-be completed NNC assessment of the Philippine Food Fortification Program that has, among others, identified factors that facilitate and deter food fortification, which should be considered for scaling up the food fortification program especially rice fortification.
 - 2.2.4.8.1 Factors that facilitate rice fortification based on the KII conducted according to the respondents in parenthesis.
 - 2.2.4.8.1.1 Support from national government, LGUs and government agencies (NFA, DSWD-National Resource and logistics Management Bureau (NRLMB), fortificant supplier).
 - 2.2.4.8.1.2 Continuous research and development with other participating agencies (NFA, Philippine Rice Research Institute (PhilRice), DSWD-NRLMB)
 - 2.2.4.8.1.3 Promotional campaigns on the use of fortified products (PhilRice, DSWD-Program Management Bureau (PMB), DSWD-NRLMB)
 - 2.2.4.8.1.4 Availability of fortificants (DSWD-PMB)
 - 2.2.4.8.1.5 Regulatory monitoring (DSWD – PMB, DSWD-NRLMB)
 - 2.2.4.8.1.6 Consultation, collaboration, and coordination of agencies (DSWD-Disaster Response Management Bureau (DRMB), DSWD-NRLMB, fortificant supplier)
 - 2.2.4.8.1.7 NFA production of IFR (DSWD-DRMB)
 - 2.2.4.8.1.8 Political advocacy on cost-effectiveness of food fortification (DSWD-NRLMB)

- 2.2.4.8.2 Factors that deter rice fortification
 - 2.2.4.8.2.1 Lack of information dissemination on the benefits of IFR (NFA)
 - 2.2.4.8.2.2 Budgetary requirements for IFR production (NFA, DSWD-DRMB)
 - 2.2.4.8.2.3 Limited capacity of rice fortification equipment and the need to sustain production (NFA, DSWD-DRMB)
 - 2.2.4.8.2.4 Cost of fortification (DSWD-PMB, DSWD-NRLMB)
 - 2.2.4.8.2.5 Executive Order 51 s.1998 requiring all rice for government projects to be purchased from NFA (DSWD-DRMB)
 - 2.2.4.8.2.6 Lack of adequate food control (DSWD-NRLMB, PhilRice)
 - 2.2.4.8.2.7 Start-up cost for fortification (DSWD-NRLMB)
- 2.2.4.8.3 Recommendations for rice fortification
 - 2.2.4.8.3.1 Identify appropriate agency tasked to strictly monitor compliance (NFA)
 - 2.2.4.8.3.2 Develop and implement a memorandum of agreement (MOA) among the agency tasked to monitor, rice millers, and traders (NFA)
 - 2.2.4.8.3.3 Regular monitoring and strict implementation (PhilRice)
 - 2.2.4.8.3.4 Strengthen agency collaboration for effective communication among government agencies (PhilRice)
 - 2.2.4.8.3.5 Public-private partnership with clear well-defined terms of partnership (fortificant supplier)
 - 2.2.4.8.3.6 Private sector support to the promotion of fortified foods (DSWD-DRMB)
 - 2.2.4.8.3.7 Develop strategies to reach vulnerable and at-risk population, consider supplementation if cannot be reached (DSWD-NRLMB)

- 2.2.4.8.3.8 More aggressive policy advocacy and need political will to legislate and regulate for public sector support and private sector involvement (DSWD-NRLMB, PhilRice, Fortificant Supplier)
- 2.2.4.8.3.9 Assess resources, constraints, quality assurance, consumption patterns, acceptability and cost (DSWD-NRLMB)
- 2.2.4.8.3.10 Tax incentives for private partner (Fortificant supplier)

These developments are important to consider in determining actions to address the gaps in iron fortification of rice.

3.0 Objectives

3.1 *General objective*

The study aimed to determine supply chain, advocacy, and campaign (social and behavior change communication) gaps that could explain the low supply, acceptance, and consumption of iron-fortified rice

3.2 *Specific objectives*

- 3.2.1 To map iron-rice fortification capacities and campaign initiatives of the Philippines
- 3.2.2 To identify the supply chain issues that hinder the implementation of mandatory rice fortification as stipulated in the Philippine Food Fortification Act of 2000 and its Implementing Rules and Regulations.

3.3 *Study output*

The study output includes recommendations and actionable guidelines to create stronger policies to help address the micronutrient gaps, specifically:

- 3.3.1 Most cost-effective and efficient delivery of IFR to target recipients;
- 3.3.2 Strategies for the increased consumption of IFR through SSNPs and its commercialization on the supply side (IRK suppliers and IFR producers) through millers, distributors and retailers and involving local farmers and communities for access to the technology for the production of IFR; and.
- 3.3.3 Communication strategies for increased knowledge and acceptance of IFR by consumers, local officials, non-government organizations (NGOs), and other stakeholders.

4.0 Methodology

The following data collection methods were used.

4.1 Desk review

Relevant documents were reviewed to determine the documented progress of rice fortification in the Philippines. The desk review helped frame the guides for the key informant interviews (KII) and focus group discussions (FGDs). Documents reviewed were WFP reports on its involvement in food fortification in the Philippines, various studies done on scaling up rice fortification in the country in SSNPs, and reports of accomplishment of agencies involved in the IATF-ZH.

A summary of the desk review is presented in Section 2.0.

4.2 Key informant interviews

4.2.1 Stakeholders interviewed

The framework of the iron rice fortification ecosystem (Figure 3) was developed and used in determining the stakeholders to be covered by the KIIs. The ecosystem shows the inputs needed to produce IFR, i.e., the IRKs (local and imported), milled rice and the inputs needed to produce these, i.e., fortificant, machines (extruders and blenders), support and technical assistance. It also shows the users of IFR particularly government SSNPs. Based on the IFR ecosystem, the following were interviewed as key informants:

- 4.2.1.1 Seven producers / potential producers / importers of IRKs;
- 4.2.1.2 Eleven producers / potential producers of IFR;
- 4.2.1.3 Four fabricators / importers of extrusion, and blending machines;
- 4.2.1.4 Four farmers cooperatives and a rice miller in BARMM;
- 4.2.1.5 Twenty representatives of 4 national government agencies that are involved in social safety net programs;
- 4.2.1.6 Representatives from the DOST at national and regional levels (four regions), including those from the FNRI, and the Technology Application and Promotion Institute (TAPI); and
- 4.2.1.7 Representatives of four BARMM government agencies/organizations and four LGUs in Maguindanao.

Most KIIs were done virtually, via the Zoom platform. However, the KIIs for stakeholders based in BARMM, Nutrition and Beyond, and DSM were done face-to-face. The list of those interviewed can be found in Annex 3.

When needed, additional information was sent by the respondents usually by e-mail.

4.2.2 Key informant interview guide

Key informant guides were developed specific to each stakeholder. However, in general, these guides generated information on the stakeholder's experiences and plans in the production or distribution or use of IFR, e.g., reasons for engaging in rice fortification, production capacity if applicable, extent of use of IFR in SSNPs, thoughts on the use of multiple micronutrient fortificant, problems encountered, and recommendations to help scale up the production and distribution of IFR.

4.3 *Focus group discussions*

Four focus group discussions were also done covering four public elementary schools in Maguindanao that used IFR in their school feeding program. The FGDs were done face-to-face with the members of the project team as facilitators and documentors with the assistance of the school feeding coordinators.

Among others, the FGDs explored what the participants knew of nutrition, sources of information, *Sangkap Pinoy Seal* as well as their thoughts and experiences on the IFR used in school feeding program and possible purchase of IFR.

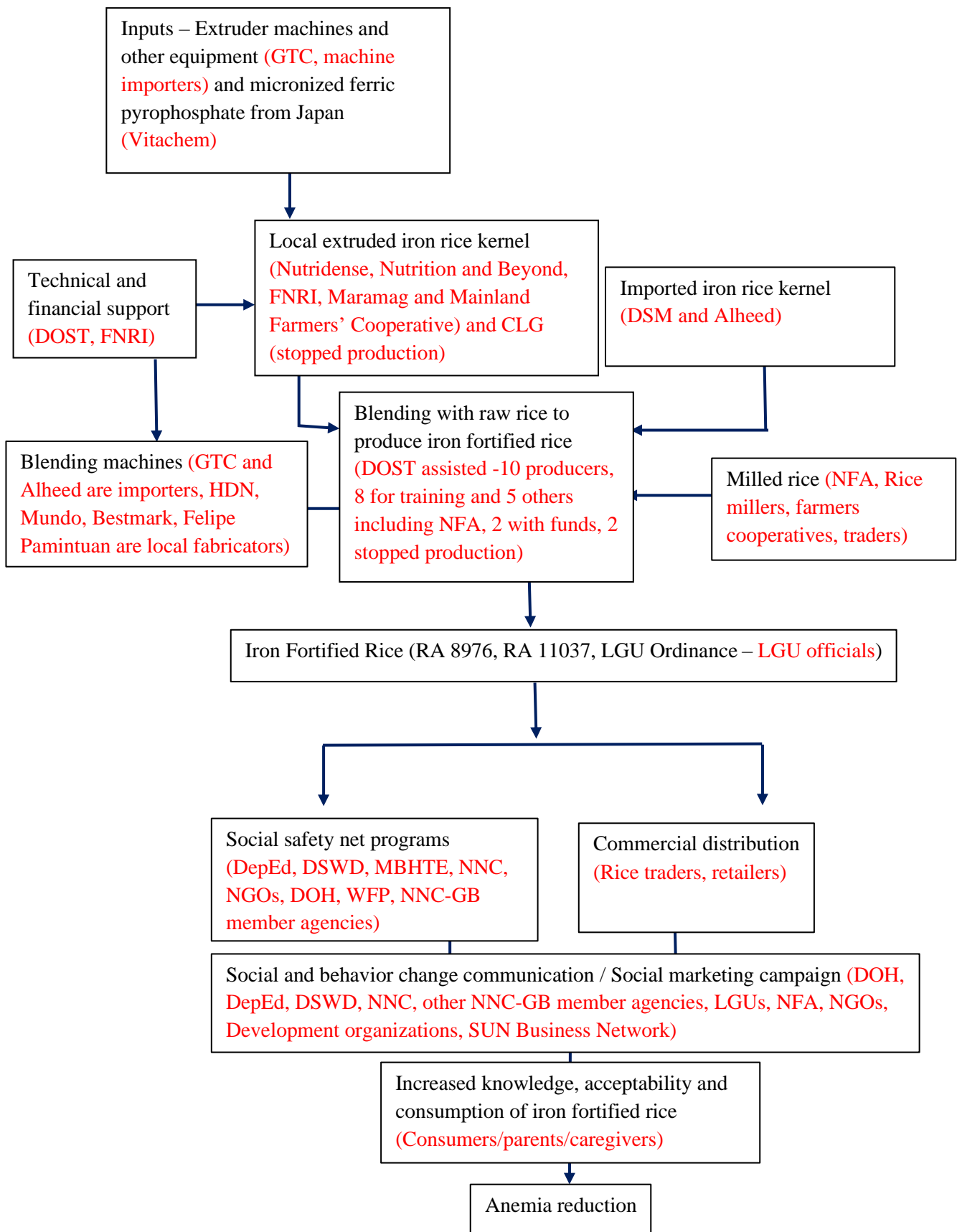


Figure 3. Rice fortification ecosystem in the Philippines.

5.0 Results and discussion

The following are the major findings and highlights of the KIIs and FGDs. Sections 5.1 to 5.8 relate to stakeholders related to the capacity to produce IFR, while Sections 5.9 and 5.10 cover the users and potential users of IFR.

5.1 Local iron-rice kernel producers/distributors

Based on the desk review, there are eight producers or distributors of IRK (Annex 4), six of which are local producers and two are importers. Of the six local producers, three are operational (two are based in Luzon and one in NCR), two are in the organizational stage (one in a region in the Visayas and the other in a region in Mindanao) and have received DOST assistance, while one producer (Mindanao-based), one of the early adopters of the technology that availed of DOST assistance, stopped its operations for lack of demand (Figure 4). The two importers / distributors also have multiple micronutrient rice premixes. These are based in Metro Manila.

Three producers of IFR namely Food Baskets Corporation based in Rizal Province in Luzon, CamSur Multipurpose Cooperative (also in Luzon) in Region 5 and Faeldonia Rice Trading in South Cotabato (Mindanao) signified their intention to produce IRK.

The following are the results of their interviews and research conducted related to their operation.



Figure 4. Mapping of producers and distributors of iron-rice kernel and fortified rice kernel in the Philippines

5.1.1 Nutridense Food Manufacturing Corporation (NFMFC) - The second adaptor of the IRK and IFR technology is NFMFC, based in Sta. Barbara, Pangasinan. It is also an adaptor of several other technologies of the DOST-FNRI.

The corporation has a license to operate and certificate of product registration from FDA. It is also registered with the Philippine Government Electronic Procurements System that allows it to participate in bidding for high-value procurement of government agencies and LGUs.

The participation of the corporation's president in a 2014 Bangkok workshop on Scaling Up Rice Fortification in Asia triggered the corporation's involvement in rice fortification.

Nutridense president, Mr. Racky Doctor said, "The Bangkok workshop was a breakthrough for me". He noted that during the workshop he saw the opportunity to address the gaps in anemia through rice fortification even with their small company.

The company acquired its extrusion machine through a soft loan from DOST under the Small Enterprises Technology Upgrading Program (SETUP) of DOST Region I

It started its production of IRK in 2015 although the first years were a "heartbreak" because the "demand of the market was not as energetic".

NFMC supplied the IRK used by the WFP in its 2019 pilot run of using IFR in school feeding programs in BARMM. This means that the IRK had to be shipped all the way to Maguindanao Province, adding on to the cost of the IRK.

Starting the last quarter of 2020, through 2021 up to 2022, there was a surge in the demand for IFR and consequently also of IRK primarily for feeding programs of DepEd and DSWD. This surge may have resulted from the implementation of RA 11037 and the push for IFR from the IATH-ZH. This surge in demand boosted the production of extruding machines from 80-100 kg/hr to the full capacity of 150 kg/hr in 2021. NFMC procured approximately 1,240 kgs of micronized ferric pyrophosphate for the production of IRK in 2021.

NFMC is also a producer of IFR and related discussions are in Section 5.4.

- 5.1.2 **Nutrition and Beyond Corporation /JD Aguilar Commercial, Inc.**— JD Aguilar Commercial, Inc. is a big rice miller based in San Leonardo, Nueva Ecija Province. It is one of the first to adopt the FNRI extrusion technology for the production of IRK.

It established the Nutrition and Beyond Corporation (NBC) for the production of IRK. Its extrusion machine and other equipment were provided through a grant from ILSI Japan with the assistance of DOST-FNRI.

NBC also tried to market IFR commercially, targeting high-end costumers. It sold IFR of good-quality rice at P 90/kg that were distributed in supermarkets. It stopped production of IFR for a while. Issues encountered in distributing in supermarket were the additional expense of the listing fee and lack of marketing and promotional campaign that resulted in losses.

It resumed operations to supply some of the IFR requirements of DepEd in 2021, costing at P17/350 grams of IFR. In 2021, responding to the surge in demand for IFR, NBC procured 200 kgs of micronized ferric pyrophosphate to produce the IRK for the IFR that it also produced.

It responds to a minimum order of 100 bags of IFR. Its blending productivity is 300 bags (50 kgs/bag)/hour.

Delivery cost is free within 150 kms from the production area. Beyond the 150 kms, a delivery fee of P45/bag of 50 kgs of IFR is charged.

A concern raised by NBC is on whether DepEd will continue to procure IFR as was observed during the pandemic when DepEd may have had additional budget for IFR instead of ordinary rice due to virtual learning and savings from its budget for maintenance and other operating expenses.

- 5.1.3 **Maramag Community Multi-Purpose Cooperative** in Maramag, Bukidnon in Region 10 where a complete continuous line extruder machine and a blending machine has been delivered for commissioning, calibration and training and possible operation in July 2022. The machine was a grant from the DOST CEST Program through DOST Region 10. This project is in partnership with the Bukidnon Provincial Government that is financing the improvement and construction of the building for the facility. This cooperative will have the opportunity to supply IRK for IFR producers in Mindanao.
- 5.1.4 **Nutritional Food Processing Facility of FNRI** Nutritional Food Processing Facility of the DOST-FNRI is located at Bicutan, Taguig City. It is used to produce small volumes of new technology-based products developed by the Institute. When not in use, this facility is offered for rent to licensed (with Technology Licensing Agreement or TLA) FNRI partners/adaptors for a certain fee per hour. It is an FDA-accredited facility in terms of good manufacturing practices. For rice fortification, the processing plant has a pilot scale extruder machine, a testing extruder machine and a complete continuous line extruder machine among others with capacities of 50-80, 5-10 and 80-100 kgs/hr, respectively. In the last quarter of 2020 up to 2021, when there was a surge in the demand for IFR for feeding programs of DepEd, NBC rented this facility to produce several tons of IRK. Other partners like NFMC also rented this facility prior to IFR commercialization. This pilot plant facility produced not only IRK but also different types of multi-nutrient extruded rice kernel.
- 5.1.5 **LGU of Laoang, Northern Samar in Region 8 in partnership with Mainland Farmers' Producers Cooperative.** DOST 8-Northern Samar has downloaded project funds to the LGU of Laoang for the purchase of a complete line extruder machine and a blending machine. This is also another support from the CEST program. To date, the LGU Laoang is preparing the bid documents for the purchase of the machines, while the cooperative is working towards the availment of the IFR technology from DOST-FNRI through a letter of intent. When operational, the cooperative could cater to the IRK and IFR needs of the provinces of Leyte and Samar, and possibly the rest of the Visayas, once operational.

5.1.6 **CLG Health Food, Inc.** based in General Santos City was one of the first to produce IRK using extrusion technology of FNRI with support through a soft loan from the DOST-SETUP. Prior to that in 2006, it produced coated IRK to produce IFR. It has stopped production due to losses incurred due to lack of demand. Its last production was multi nutrient extruded rice kernel for the research conducted by DOST-FNRI in Marawi City. Lately, its extruder machine was found to still be in good working condition. Currently, CLG is discussing with DOST Region 12 and FNRI on the next steps for the operation of the extruder machine.

If the currently operational producers of IRK and the would-be producer in Maramag, Bukidnon operate on full capacity, total production of IRK in a year would be about 1,360 metric tons of IRK (Table 2). This assumes that the extruding machines work at full capacity per hour, operate 8 hours a day, and 6 days in a week for 48 weeks. However, this is the ideal scenario which may increase if needed (e.g., run two 8-hour shifts) or decrease depending on demand. At a price of P350 to P400/kg total sales could range from P475,776,000 to P543,744,000.

Using a 1:200 blending ratio, the estimated production of IRK in a year can produce about 271,872 metric tons of IFR.

Table 2. Estimated production capacity of local producers of iron-rice kernel

Producer	Maximum capacity in kg/ hr	Total production in kgs	
		<i>Per day</i> (8 hours / day)	<i>Per year</i> (8 hours per day for 6 days per week for 48 weeks)
Nutridense Food Manufacturing Company	100	800	230,400
Nutrition and Beyond Corporation	200	1,600	460,800
FNRI	190	1,520	437,760
Maramag (once operational by July 2022)	100	800	230,400
Total, in kgs	590	4,720	1,359,360
Total in metric tons	0.59	4.72	1,359.36

The total maximum local production of FRK is 1,359.36 MT for 1 shift of 8 hrs/day for 6 days a week and 48 weeks. However, this is the most ideal scenario which may increase if needed (for 2 shifts) or decrease depending on demand. At a price of P375 to P450/kg the total sales could amount to approximately P500 million/year

5.2 *Importers of IRK*

- 5.2.1 **Alheed International Trading Corporation** – The company imports IRK and agricultural equipment including blenders for rice fortification. It has a sister company, Alheed International Agro Industries, Inc. that produces IFR.

It supplies both coated and extruded IRK imported from the Wright Group based in Ohio, USA. In addition to IRK or IRONRICE, the Wright Group also supplies NUTRARICE a multi micronutrient kernel with vitamin A, iron and folic acid. According to the interviewee from Alheed International Trading Corporation, the Wright Group can supply IRK through its IRONRICE based on any specifications by the buyer for use at various mixing ratios from 1:100 to 1:400.

Alheed International Trading Corporation supplied NFA with the coated IRK with ferrous sulfate, during the AHMP from 2005 to 2010. The interviewee noted that the coated IRK is cheaper than the extruded IRK of the Wright Group. Currently, Alheed has not been able to sell IRK or IRONRICE.

It requires a minimum order of 5 tons and estimates a 60-days lead time for the importation of IRONRICE.

The shelf life of coated, IRONRICE, is five years and two years for extruded IRK.

- 5.2.2 **DSM/IMCD.** DSM produces nutritional and pharmaceutical ingredients and industrial chemicals that are distributed worldwide. One of its major nutritional products is fortified rice kernel for rice fortification.

In the Philippines, IMCD Philippines is one of its distributors and together with DSM both are working in the promotion and distribution of DSM fortified rice kernel. DSM's fortified rice kernel, produced through the extrusion process, is produced in Thailand. Its premix consists of eight vitamins and minerals. Annex 8 shows the composition of the vitamins and minerals of the DSM fortified rice kernel as well as the intake of these micronutrients based on the 2002 Recommended Energy and Nutrient Intake of FNRI (still being used by FDA for nutrition labeling) assuming consumption by the vulnerable group at either 100 grams or 200 grams of cooked fortified rice using DSM fortified kernel mixed with milled rice at 1:100 as required in the old FDA standard for IFR. It is to be noted though that mandatory food fortification standards (Annex 2) cover only iron and not the other nutrients in the DSM fortified rice kernel.

IMCD supplied an initial five metric tons of fortified rice kernel. In the Philippine rice fortification program.

Based on the labeled iron content of DSM fortified kernel at 600 mgs/100 grams if mixed at 1:100 ratio with milled rice, the fortified rice would contain, 6 mg/100 grams of rice which is the upper limit of the current standard of 2 mgs to 6 mgs iron/100 grams for IFR.

Based on this, it is still feasible to mix the DSM fortified kernel at 1:200 ratio similar to the locally produced IRK using the local blending machines calibrated at 1:200 mixing ratio, in which case the IFR would then contain approximately 3 mgs of iron per 100 grams which is still within the standard to 2 mgs to 6 mgs per 100 grams IFR. At this ratio, DSM should also test the iron content of the cooked fortified rice if it is not less than 0.6 mg/100 grams of cooked rice as provided in the standard.

The price of the DSM fortified rice kernel was determined to be competitive for use for the Philippine rice fortification program even with the seven minerals and vitamins in addition to iron.

Minimum order requirement is 5 metric tons due to its production batch. If mixed at 1:200 ratio, this minimum order can fortify 1,000 metric tons of rice, which could be a limiting factor for the sales of the fortified rice kernels given the capacity of the IFR producers (See Section 5.5) given the budget needed to procure this much rice and the IRK. Only those with a high fortified kernel requirement, e.g., NFA, may have the capability to buy this quantity of fortified kernel. Other IFR producers could be compelled to buy local fortified kernel due to their limited capability

The shelf life of one year could again be a limiting factor in consideration of the 5 metric tons (MT) minimum order.

DSM would require a lead time of 3 months for the delivery of the fortified rice kernel.

The market for imported fortified kernel is limited by the minimum requirement of 5 MT that would require 1 million kgs of rice to produce of IFR at 1:200 mixing ratio requiring an investment of about P50 million. Only those with big IRK requirements, e.g., NFA, or those with this capital may have the capability to buy this amount of IRK.

5.3 *Importer of micronized ferric pyrophosphate*

Vitachem Industries is the exclusive distributor of micronized ferric pyrophosphate from Taiyo Kagaku Ltd., based in Japan, which funded the FNRI research on the use of their fortificant for extrusion technology for the production of IRK. Micronized ferric pyrophosphate is currently the only fortificant being used for the production of local IRK.

In 2021, Vitachem supplied 1,440 kgs of the fortificant and it has a current inventory of 1,500 kgs of the fortificant to be able to ensure that there is available supply of the fortificant. The manufacturer has requested Vitachem to make projections on the needed supply of the fortificant given also the problems being encountered by Taiyo Kagayyu in the production of the fortificant due to the decrease in demand.

5.4 *Fabricators and suppliers of equipment for rice fortification*

There are six major suppliers of equipment for rice fortification but only one is supplying a complete line for extruder machine for the production of IRK (Annex 5).

Five of these suppliers are in Luzon, and one is in Mindanao. Figure 5 shows the location of these fabricators and suppliers.

- 5.4.1 **GTC Propack Corp** based in Taguig City, importer of continuous line extruder with a capacity of 80 to 120 kg/hour and blending machine at 30 to 40 bags (50 kg/bag)/hour; both machines are from China; already supplied 5 extruder machines and 1 blending machine.
- 5.4.2 **Mundo Engineering Works** based in Nabunturan, Davao de Oro; fabricates portable blending machine at 30 to 40 bags/hour; already supplied 4 blending machines.
- 5.4.3 **HDN Technology and Resources Inc.** based in Carmona, Cavite; fabricates portable blending machines at 30 to 40 bags (50 kg/bag)/hour; already supplied 9 blending machines mostly for cooperatives. This company has a TLA with DOST-FNRI as it used the design of FNRI for the fabrication of blenders.



Figure 5. Mapping of fabricators and distributors of equipment for rice fortification in the Philippines

- 5.4.4 **Bestmark Agro Industrial Corporation** based in Santa Barbara, Pangasinan; fabricates blending machines at 50 bags (50 kg/bag) per/hour already supplied 3 blending machines.
- 5.4.5 **Felipe Pamintuan Machine Shop and Fabrication** based in San Carlos City, Pangasinan; fabricates blending machines at 50 bags (50 kg/bag)/hour already supplied 1 blending machine.

5.4.6 **Alheed International Trading Corporation** based in Pasig City, importer of blending machines from Vietnam, at 5 metric tons (100 bags of 50 kilograms per bag)/hour; supplied NFA with 23 blending machines (see Annex 7 for the location of these blending machines) for the AHMP from 2005 to 2010, which NFA said would be difficult to revive due to lack of spare parts; currently supplied 4 new blending machines for NFA pilot testing of iron rice fortification.

Alheed International Trading Corporation should assist NFA in reviving its blending machines used for AHMP from 2005 to 2010 as part of its after-sales service.

5.5 Iron fortified rice producers

Annex 6 is the list of IFR producers with blending machines. Most of these producers are assisted by DOST Regional Offices and DOST-FNRI through their various financial and technical assistance programs. Of the 23 producers, 10 are operational. Eight 8 already have their equipment delivered to them and these will still need to be calibrated, 1 is procuring the machine, 1 is still organizing partner cooperative, 1 is pilot testing (NFA) and 2 have stopped operations.

5.5.1 IFR producers with operational blending machines

Only 2 of the 10 operational IFR producers are in Mindanao and the rest are in Luzon (Figure 6). Eight of these producers have a TLA with FNRI, while 2 do not have such licensing agreement. Figure 6 is a mapping of the current IFR producers while Table 3 shows their respective production capacities.



Figure 6. Mapping of current producers of iron fortified rice

Table 3. Production capacity of current producers of iron-fortified rice

Company / Group	Production capacity (tons/hour)
<i>DOST-assisted with FNRI TLA</i>	
1. Nutridense Food Manufacturing Corporation in Pangasinan	4.5
2. Tangcarang Techno Demo Farm of the Local Government Unit in Alaminos City, Pangasinan	2.5
3. San Pablo Multipurpose Cooperative	2.5
4. JD Aguilar Commercial, Inc	5.0
5. Food Basket Corporation	5.0
6. CamSur Multipurpose Cooperative	2.0
7. Antofel Trading/Saavedra Rice Mill	2.0
8. FNRI (For rental only to FNRI Licensed producers)	4.5
<i>No TLA with FNRI, machines were company-purchased</i>	
1. Alheed International Agro-Industries, Inc.	5.0
2. Faeldonia Rice Trading	5.0

5.5.2 DOST-assisted with blending machines, for training of staff and calibration of machines– By the 3rd quarter of 2022, there will be eight additional producers of IFR after completing the training and commissioning of the machines by FNRI and DOST Regional Offices, which are currently ongoing.

Figure 7 is the mapping of these future IFR producers. Seven of these 8 producers are based in Luzon and 1 is based in Mindanao. Of the 7 based in Luzon, 4 are from Region 1. Seven of these producers have a production capacity of 2 tons/hour and one has a slightly higher capacity at 2.5 tons/hour.

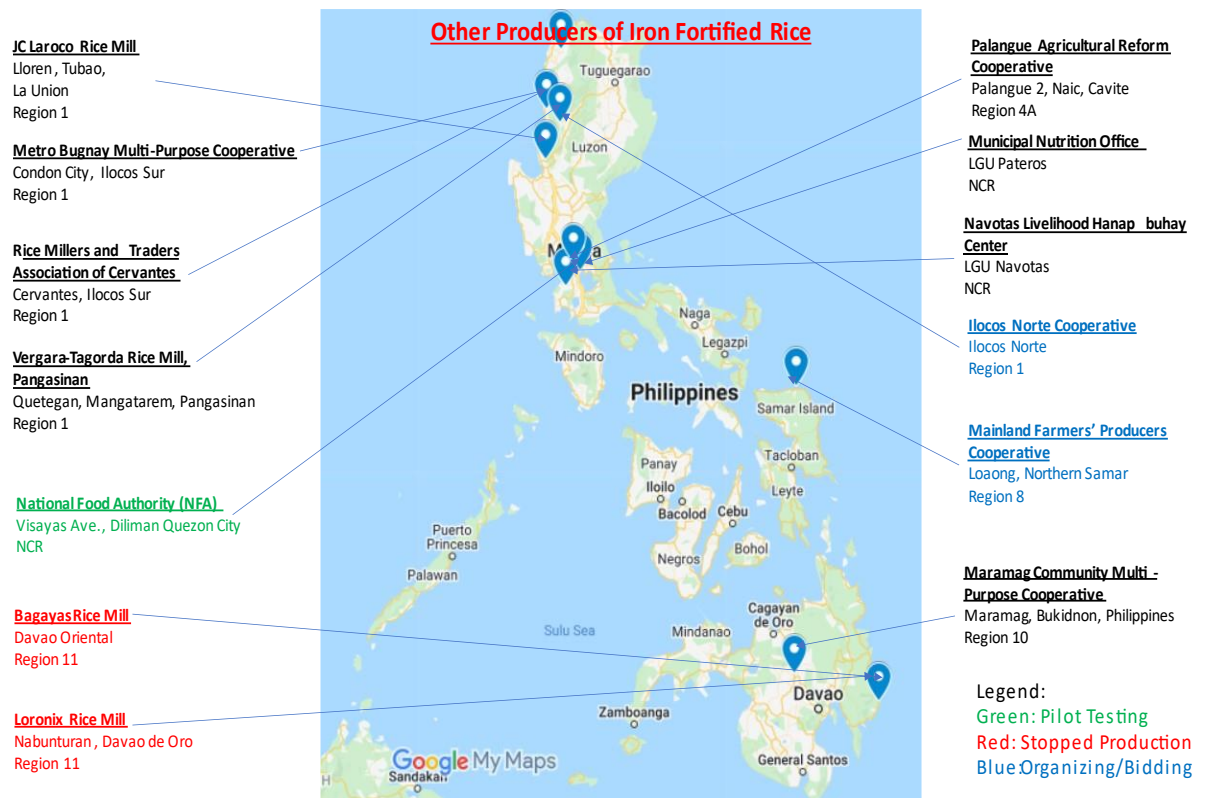


Figure 7. Mapping of producers in the training and calibration phase

5.5.3 “Others” category of iron-fortified rice—In addition to IFR producers that are operational and will be operational toward the end of the year, there are IFR producers that can be put in the “others” category.

5.5.3.1 NFA will be pilot testing the production of IFR. It has procured 4 blending machines that will be installed in NFA warehouses in Regions 2, 3, NCR and 4 (all in Luzon). Each blending machine has a maximum production capacity of 5 tons/hr. About 84,000 kgs (84 MT) of IRK will be procured for the pilot testing.

If the pilot testing is successful, NFA will procure 27 additional blending machines to meet its target of fortifying 50% of the buffer stock (or approximately 150,000 MT requiring 750 MT of IRK) by 2023.

It is to be recalled that NFA used to buy and sell rice, which are at subsidized price to protect both producer and consumer from price shocks. There is also an executive issuance Executive Order 51 s. 1998 that requires the procurement of NFA rice for government projects that use rice.

NFA previously distributed IFR, with the IRK produced using the coating technology as part of the AHMP during the presidency of Gloria Macapagal Arroyo. As part of its commitment to implement RA 8976, it installed blending machines nationwide as shown in Annex 7.

However, with the enactment of RA 11203 or the Rice Tariffication Law in 2018, the role of NFA from being the government regulatory and rice stabilization agency is now limited to buffer stocking of rice reserved for use by DSWD and LGUs in emergency situations. This resulted in concerns on which agency will monitor the rice industry including IFR production. This issue has not yet been resolved among the Department of Agriculture, FDA and the Department of Trade and Industry (DTI).

Nonetheless, in 2021, NFA committed to fortify 50% of its buffer stocks. It developed a workplan with a budget of P530.5 million. Based on this workplan, NFA will not use its existing blending machines as these were deemed not in working condition and cannot be revived. It would procure 31 new blending machines at a cost of P175 million. Four of these machines have been procured as noted earlier in this section.

- 5.5.3.2 Ilocos Norte, Region 1 (Luzon). The equipment for IFR production in Ilocos Norte are available but DOST Region 1 is still identifying a partner cooperative.
- 5.5.3.3 LGU Laoang, North Samar (Visayas) in partnership with Mainland Farmers' Producers Cooperative, in Region 8. DOST funds have been downloaded to the LGU that is procuring the equipment for IFR production and is at the bidding stage.
- 5.5.3.4 Loronix Rice Mill in Nabunturan, Davao de Oro and Bagayas Rice Mill in Davao Oriental. These two producers, both from Region 11 in Mindanao, were the first to avail of blending machines from DOST-Region 11 but have stopped operations due to lack of demand for IFR. Each of these producers have a capacity of 2 tons/hour.

5.5.4 Maximum capacity for local production of IFR and IRK requirement

The maximum production of IFRs that are currently operational, and those that are in the training and calibration phase totals 116,928 MT/year requiring about 585.08 MT of IRK (Table 4), which is 43% of the maximum local capacity for IRK of 1,359.36 MT. Including the IRK requirements of those in the “others” category, except NFA as it is likely to buy imported IRK, an additional 92.16 MT of IRK is needed, for a total of 677.24 MT. This volume requirement is about 50% of the maximum IRK production.

The approval of the 25 letters of intent to avail of the IRP/IFR technology could further increase the capacity for IFR production to “meet” the capacity for IRK production.

Table 4. Maximum capacity of production of iron-fortified rice and requirements for iron-rice kernel

Producer	Maximum capacity in MT/ hr	Total production in metric tons		IRK requirement <i>(Mixing ratio of 1:200 of IRK:rice)</i>
		<i>Per day (8 hours / day)</i>	<i>Per year (8 hours per day for 6 days per week for 48 weeks)</i>	
Nutridense Food Manufacturing Corporation	4.5	36	10,368	51.84
Tangcarang Techno Demo Farm of the Local Government Unit in Alaminos City, Pangasinan	2.5	20	5,760	28.80
San Pablo Multipurpose Cooperative	2.5	20	5,760	28.80
JD Aguilar Commercial, Inc	5.0	40	11,520	57.60
Food Basket Corporation	1.25	10	2,880	14.40
CamSur Multipurpose Cooperative	2.0	16	4,608	23.04
Antofel Trading/Saavedra Rice Mill	2.0	16	4,608	23.04
FNRI	4.5	36	10,368	51.84
Alheed	5.0	40	11,520	57.60
Faeldonia	5.0	40	11,520	57.60
<i>Currently operational</i>	<i>34.25</i>	<i>274</i>	<i>78,912</i>	<i>394.6</i>
JC Laroco Rice Mill	2	16	4,608	23.04
Metro Bugnay Multi-Purpose Cooperative	2	16	4,608	23.04
Rice Millers and Traders Association of Cervantes	2	16	4,608	23.04
Vergara-Tagorda Rice Mill	2.5	20	5,760	28.80
Palangue Agricultural Reform Cooperative	2	16	4,608	23.04

Producer	Maximum capacity in MT/ hr	Total production in metric tons		IRK requirement <i>(Mixing ratio of 1:200 of IRK:rice)</i>
		<i>Per day (8 hours / day)</i>	<i>Per year (8 hours per day for 6 days per week for 48 weeks)</i>	
Municipal Nutrition Office of Pateros	2	16	4,608	23.04
Navotas Livelihood Hanapbuhay	2	16	4,608	23.04
Maramag Community Multi-purpose Cooperative	2	16	4,608	23.04
<i>Producers in training and calibration phase</i>	<i>16.5</i>	<i>132</i>	<i>38,016</i>	<i>190.08</i>
NFA	20	160	46,080	230.40
Ilocos Norte, DOST Region I	2	16	4,608	23.04
Mainland Farmers' Producers Cooperative	2	16	4,608	23.04
Bagayas Rice Mill	2	16	4,608	23.04
Loronix Rice Mill	2	16	4,608	23.04
<i>Others</i>	<i>28</i>	<i>224</i>	<i>64,512</i>	<i>322.56</i>

According to most of the producers of IFR with support from DOST, the cost of fortification is approximately P4. The additional cost covers 1) the cost of IRK (P1.88 to P2.25/kg (assuming IRK costs P375 to P450/kg), 2) mixing cost of P1.30/kg or P65/50-kg-bag as estimated by Faeldonia, but only P35/50-kg-bag for NFA, and 3) FNRI royalty fee of 2% of total sales. The royalty fee does not apply to those without a TLA

5.5.5 Issues and concerns of IFR producers

- Lack of IRK supply or delay in acquiring IRK in 2021, which is partly due to the sudden surge of requirements, for which producers were not prepared.
- Lack of promotion on rice fortification, resulting to low demand and eventually to the closure of the two early technology adopters.
- FNRI royalty fee as disadvantageous to those required to pay the fee in addition to the P15,000 fee for the TLA. Some of those interviewed especially DOST Provincial Directors requested a lowering or waiver of these fees especially for cooperatives as also a way to encourage more adaptors particularly from cooperatives.
- Potential negative effect on sales of IFR producers once NFA starts producing IRK since the price of NFA rice is much lower than that of commercial rice.
- Low maximum bid price of DepEd for IFR, which is not realistic given the price of milled rice and the additional cost of fortification, packaging, and transport.

5.6 *Suppliers of rice*

Millers are the major suppliers of rice. Several of the IFR producers and those that expressed interest to produce IFR are farmer's cooperatives with the hope that rice fortification could increase their profitability.

Current producers of IFR that are millers are NBC, Alheed International Agro-Industries, Inc, CamSur Multi-Purpose Cooperative, Antofel Trading and Faeldonia Rice Trading as well as NFA after its pilot testing.

Four farmer's cooperatives and one private miller in South Cotabato were interviewed with the following highlights:

- 5.6.1 Three cooperatives have rice mills all assisted through a grant from the BARMM Ministry of Agriculture. Of the three cooperatives interviewed, Al Rahman Farmers' Cooperative in Mamasapano, Maguindanao is operational, while the other two were non-operational – one in Pamatuladan in Datu Saudi Ampatuan due to the need to repair the mill and in Talapaso in Guindulugan due to lack of power supply.
- 5.6.2 All respondents were not aware of RA 8976, EPAHP and DOST grants and soft loans as possible source of funding, while only one interviewee is aware of RA 11037.

- 5.6.3 All of the cooperatives are **willing to fortify** by acquiring a blender machine with assistance from DOST/Ministry of Science and Technology (MOST), and they will be assisted in their application by MOST, initially through a review of the requirements and a letter of intent addressed to DOST-FNRI. For the initial evaluation, priority should be given to those with a rice mill and those that can install a 3- phase electrical supply in addition to the documentary requirements to avail of the assistance.
- 5.6.4 Faeldonia Rice Trading is already fortifying its rice, using its own blending machines and is willing to avail of the technology of IRK from DOST-FNRI and acquire an extruder machine with assistance from DOST

The Cooperative Development Authority with the Department of Agriculture should conduct seminars/orientations with farmer’s cooperatives to advocate their support for rice fortification.

5.7 *Multiple micronutrient fortification*

All of the IFR producers were willing to use multi micronutrient fortified kernel for as long as there is a government policy, the price is competitive, and the kernel would pass FDA standard for iron content.

Importers of IRK can provide IRK that contains vitamins and minerals other than iron. However, their minimum order requirement of 5 MT is limiting. At this time, only NFA may have the capability to buy this amount of IRK. For its pilot testing project using 4 blending machines, NFA would require 84 MT of IRK, which only importers are capable of supplying based on NFA delivery schedule. Importers should also devise strategies to be able to sell their IRK/FRK to small producers.

FNRI has developed and tested the use of multi nutrient extruded rice kernel that can be considered for multiple micronutrient fortification. However, there is no local producer of multi nutrient extruded rice kernel.

5.8 *Financial and technical assistance for rice fortification*

5.8.1 **Department of Science and Technology**

The DOST has been instrumental in increasing the number of adopters of the technology of iron rice fortification through four of its programs. The requirements for these programs can be accessed from the DOST website. Applications to these programs are received and processed at the DOST Regional Offices.

- 5.8.1.1 Grants-in-Aid (GIA) Program “aims to harness the country’s scientific and technological capabilities to spur and attain sustainable economic growth and development. Through the funding of relevant science and technology (S&T) undertakings, the GIA program aims to contribute to productivity improvement and quality of life of Filipinos by generating and promoting appropriate technologies.” The assistance given is a grant.

- 5.8.1.2 Community Empowerment for Science and Technology (CEST) – “a package of S&T interventions, which aims to build progressive, empowered and resilient rural communities. The program is targeting to empower the poorest and most depressed communities in the country, via S&T interventions in health and nutrition, water and sanitation, basic education and literacy, livelihood/economic enterprise development, and disaster risk reduction and climate change adaptation.” The assistance given is also a grant.
- 5.8.1.3 Small Enterprise Technology Upgrading (SETUP) – “a nationwide strategy encouraging and assisting micro, small, and medium enterprises (MSMEs) to adopt technological innovations to improve their products, services, operations and increase their productivity and competitiveness”. Among others it supports the acquisition of equipment on soft loan that is interest free, payable in three years but with a 6-months grace period.
- 5.8.1.4 Technology Application and Promotion Institute – provides soft loans, interest free, mostly to MSMEs, ranging from P2 million to P5 million. So far, no application on rice fortification have been received.

5.8.2 **DOST-Food and Nutrition Research Institute**

The DOST-FNRI developed technologies for rice fortification specifically the production of IRK using hot extrusion for premix and blending machines for IFR. In 2013, it conducted awareness seminars in Mindanao and Luzon resulting to the transfer of technology for two complete line extruder machines (CLG and Nutridense) and four blending machines.

Recently, FNRI successfully produced multi nutrient extruded rice kernel with iron, Vitamin B1, Vitamin B2, Vitamin A, folic acid and zinc. These kernels were used in rice used for supplementary feeding of 77 families who were affected by the Marawi Siege. FNRI exported multi nutrient extruded rice kernel to Vietnam and Cambodia for research on its possible use.

FNRI follows a technology transfer protocol that starts with the submission of a letter of intent by an interested party. This is followed by consultative meetings, technology needs assessment, and assessment and evaluation of the results of the assessment. Once the assessment is favorable, further negotiations are done ending in the finalization and signing of the TLA. With a signed TLA, FNRI provides technical assistance through trainings and advise related to various concerns, e.g., plant layout, equipment and facilities, production trials and control, and product quality improvement.

FNRI, in coordination with the regional offices of DOST, monitors and evaluates those with TLAs, specifically along business performance and product quality.

Entering into a TLA on iron rice fortification with FNRI will involve an initial payment of P50,000 for IRK production, and P15,000 payment for IFR production, and 2% royalty of the total sales of IRK and/or IFR.

Some stakeholders expressed concerns on the fees for the TLA and the royalties, with DOST Region 1 requesting that licensing fees and royalties be reduced or waived to encourage more adopters. FNRI still has to respond to this concern.

The need to develop other blender designs, e.g., for those with small or no rice mills, was also noted since the current design of the blender is for rice mills.

FNRI also developed IEC materials on IFR, targeting consumers and LGUs but these have not been disseminated.

5.8.3 Ministry of Science and Technology in BARMM

The Ministry of Science and Technology in BARMM “is mandated to set direction and leadership in science, research, inventions, technology education, their development”.

It intended to set up a pilot facility for IFR production in Carmen, Cotabato before assisting other farm cooperatives. However, this initiative was challenged by a failed bidding for a blending machine due to the lack of accredited fabricators. However, MOST will continue to look for other farmer cooperatives that can be linked to the DOST programs of assistance related to rice fortification.

During the interview, representatives of MOST were informed that the issue on the acceptability of IFR was addressed with the use of extrusion technology. MOST was also, provided a list of accredited fabricators, and a list of cooperatives visited in BARMM possible partners. MOST was also advised on the need for letter of intent to DOST-FNRI as initial step to acquire DOST technical assistance.

5.9 *Social safety net programs / feeding programs that use rice*

5.9.1 Department of Education

The DepEd launched a breakfast feeding program for malnourished schoolchildren in SY 2010-2011 and continued its pilot implementation up to SY 2012-2013. Results of the pilot implementation for 120 days feeding showed that 73% of program participants were converted to normal status and improved class attendance (98%), performance and health habits. Based on these results, DepEd renamed and started implementation of the SBFP in SY 2014-2015. The program involves the provision of nutritious meals to acutely malnourished elementary school children from Kindergarten to Grade for 120 days. The continued implementation of the program is inspired by indications of its impact. About **72.8% and 76.6% of program participants were rehabilitated** in school year (SY) 2018-2019 and SY 2019-2020, respectively however, the performance in BARMM was not as good with **20.5% of program participants reported to have been rehabilitated** in SY 2018-2019. in 2019-2020 no data on BARMM were provided.

As noted earlier, the SBFP was institutionalized with the passage of RA 11037, that among others, requires the inclusion of fortified foods in the meals to be served to program participants.

Thus, the SBFP guidelines for SY 2020-2021 called for the use of “nutritious food products” that, based on the guidelines’ Annex 4.1, included iron-rice premix and iron-fortified rice. The guidelines for SY 2021-2022 (DO 031 S 2021) also included rice among foods that can be used but specified a 4-kilograms cap, i.e., providing 400 grams of IFR for a maximum of 10 days. The supplemental guidelines for SY 2021-2022 (DO 010 S 2022) covered program implementation in the 2022 parts of SY 2021-2022 and provided a 5-day cap for the provision of 350 grams of rice.

5.9.1.1 DepEd procurement of IFR

With these issuances, DepEd became the main buyer of IFR, procuring P85,640,857 worth of IFR in 2021 (see Annex 9) mostly for schools in Luzon except for Carcar City in Cebu Province with Mati City and Digos City, both in Region 11 awaiting confirmation. Note that Pangasinan alone in Region 1, procured P52,861,326 worth of IFR or 61.7% of the total IFR procured by DepEd. This could have been facilitated by the presence of 3 operational IFR producers in the region. This may have partly triggered the interest of a number of rice mills and cooperative to be involved in iron rice fortification with an additional 5 by the end of 2022.

5.9.1.2 Projected DepEd requirement for IFR

As the country moves to a situation that will allow face-to-face attendance in schools, the serving of hot meals that will use 350 grams of rice per 5 days during the 120-day feeding is a safe assumption, each target participant will then need approximately 8.4 kilograms of rice. Projected to 3,642,031 program participants (based on targets for SY 2021-2022), a total of 30,593 MT of IFR is needed (Annex 10 that includes rice requirements for SBFP by region). This volume is just about 26.2 % of the maximum capacity of already-operational IFR producers and those that are in training and will be operational in 2022.

5.9.1.3 Issues and concerns on DepEd use of IFR

In its report to the IATF-ZH, DepEd last December 2021, DepEd noted the following issues and concerns:

- The suppliers should undergo processing and approval of IFR certification from FNRI as required by DepEd, which resulted in delays in procurement of IFR. In the case of Occidental Mindoro, the procurement did not push through due to the bidder’s lack of a TLA with FNRI. The requirement for a TLA is part of the bidding specifications. However, this requirement is not included in the guidelines for the SBFP.
- The cost of IFR is high and varies from P60 to P90 per kg, way above the P 18-peso per 400 grams (P45/kg) budget such that in the case of Occidental Mindoro, the bidding failed.

- Suppliers of IFR refuse to bid for the requirement for IFR as they assess that the cost of P18 per 400 grams of IFR or P45/kg as provided in DO No. 031 s. 2021 is not high enough to generate profit. Following discussions with FNRI, the maximum bid price was increased to P18 per 350 grams or P51/kg under DO No. 10 S. 2022.

5.9.2 Department of Social Welfare and Development

The DSWD has several programs that should use IFR following NNC Governing Board Resolution No. 1 on the use of IFR for SSNPs. The following gives an overview of these programs.

5.9.2.1 Supplementary Feeding Program (SFP) for Child Development Centers:

Like the DepEd SBFP, the DSWD has long supported supplementary feeding programs in child development centers (formerly called day care centers). The program also covers children participating in supervised neighborhood play.

DSWD's attempt to use IFR in SFP started in 2012 with the issuance of Administrative Order No. 8 s. 2012 "Omnibus Guidelines in the Implementation of Supplementary Feeding Program (SFP)" that among others provided for the procurement of IFR, "The rice could be procured by the DSWD-ARMM, provincial/city/municipal social welfare and development office from National Food Authority Regional Office. The rice that shall be delivered should be iron-fortified, to the extent possible." However, the use of NFA IFR did not continue after the initial procurement of IFR due to sensory and physical problems of the IFR.

Under Memorandum Circular 12 Series of 2020, the rice requirement per child in all child development centers and supervised neighborhood play is 100 grams/day/participant for 120 days for a total of 12 kgs/participant for the cycle year. This is expected to continue even after the pandemic as this was also the case before the pandemic as provided in Memo Circular No. 13 s. 2019. In addition, the SFP budget is P15/child for both the rice and viand.

Program implementation is decentralized and procurement of food for the program is done either by DSWD Field Offices or partner LGUs. The procurement of rice is done through bidding but most of the rice requirement is procured from NFA. With the implementation of the EPAHP, food for the supplementary feeding program are also procured from local farmers.

The DSWD Central Office provided implementors with a list of IFR producers in May 2018. However, no IFR was procured due to the following: not available in the market nor in NFA, high price, and the unpleasant taste of IFR.

Based on an annual target of 2,053,383 participants (2015) as provided in Annex 7 including regional targets, and on a 100 g-rice allocation per child per day, the total requirement for IFR is about 24,640 MT that requires 123.2 MT of IRK. This level of IFR is about 50% of the maximum capacity of the NFA in the pilot stage.

With full devolution arising from the Supreme Court Mandanas-Garcia ruling, the SFP will eventually be fully devolved to LGUs by 2023. This means that implementation and procurement will be done by LGUs. Consequently, ensuring that IFR is procured and used for the SFP will be a responsibility of the LGU. DSWD is currently crafting its devolution transition plan in this regard.

The transfer of the SFP to the LGU's would require extensive advocacy on the need to use IFR. The operations manual to be used by the LGUs should include various sources of IFR and types, including multi micronutrient premix as provided in this

5.9.2.2 Bangsamoro *Umpungan* sa Nutrisyon or BangUN

The program involves supplementary feeding of about 22,000 children 0-12 years old for 180 days in the BARMM. It is implemented by DSWD Field Offices in Region 9 for Basilan, Sulu, and Tawi-Tawi, Region 10 for Lanao del Sur, and Region 12 for Maguindanao, in partnership with LGUs as expressed in a MOA. The program though is not devolved to LGUs.

Procurement is done by DSWD Field Offices with the rice requirements being procured from NFA. The program has not used IFR in its feeding program although it received IFR in 2017 in Sulu as a donation from the DOH-BARMM. However, the children did not eat the IFR due to sensory and physical issues.

In 2021, a total of 8,867 bags of rice, equivalent to 443.35 MT, were procured. If this requirement remains constant, then 2.22 MT of IRK are needed to produce the IFR.

According to the project coordinator, when food packs were provided, only about 10% of target children improved their nutritional status as the food packs were also eaten by other family members. However, if the feeding is implemented through an on-site scheme, 50% to 60% of program participants could improve their nutritional status.

Identified problems were on storage of rice, continued perception on the bad quality of IFR, cultural preference for rice, and the need to translate nutrition and related messages in terms that is understandable to program participants.

Given, the need to continuously improve the nutrition situation in BARMM, the BANGUN Program should include in its guidelines the use of IFR as IFR is available and being used in BARMM for the DepEd School-Based Feeding Program.

5.9.2.3 Disaster response

The DSWD leads the Food and Non-food Items Cluster of the National Disaster Risk Reduction and Mitigation Council. It is tasked to provide relief during disasters including the provision of food packs for the victims of disaster. It prepositions family food packs with food items as per DSWD Internal Memorandum dated 31 July 2015, that among others includes IFR.

It procures rice from NFA due to Executive Order 51 s. 1998 that requires rice for government projects to be procured from NFA. Since NFA does not have IFR, no IFR has been procured for inclusion in the family food packs for emergencies. Nonetheless, those interviewed indicated willingness to buy IFR if it is from NFA.

The lack of advocacy and promotion on IFR was noted with a suggestion to seek the assistance of the Presidential Communications Operations Office and DTI in this regard.

5.9.2.4 DSWD *Pantawid Pamilyang Pilipino* Program (4Ps) Program

According to DSWD, the 4Ps Program is a social protection program that focuses on human capital development through the provision of cash grants to eligible households subject to their compliance to education and health conditionalities. There are 4.4 million family beneficiaries of the 4Ps program. Included in the grant is a P600 monthly rice subsidy given as cash. It conducts family development sessions for the beneficiaries that includes a module on health and nutrition. The manual for the family development sessions are currently being updated. That a module on rice fortification can be included in these sessions through a request of IATF-ZH or the Sub-TWG on rice fortification addressed to the Director of the 4Ps Program.

5.9.3 National Nutrition Council (NNC)

The NNC is currently modeling a dietary supplementation program that targets pregnant women and children 6-23 months old, the *Tutok Kainan* Program as a response to the COVID-19 pandemic and related emergencies.

The program includes the provision of various food items to targets, including IFR, i.e., 1 cup of IFR for pregnant women for 90 days, ¼ cup of IFR for infants 6-11 months old and ½ cup of IFR for one-year olds (12-23 months old) for 180 days. The program completed phase 1 and phase 2 that procured 127,999 kgs. (128 M.T.) of IFR, while an additional 107, 111 kgs (107.1 M.T) of IFR will be procured for phases 3-5.

With full devolution following the Mandanas-Garcia ruling, LGUs are expected to take over the dietary supplementation program in the first 1000 days.

In addition to supplementary feeding, the program also involves a nutrition education component, using text messaging as a main strategy. Under this system daily messages are sent to recipients through text messaging. Once a week, there is a quiz through which 20 winners get a mobile load prize. Messaging related to rice fortification will be included. Current issues is the declining responses to the quiz. Nonetheless, it was noted that text messaging was a more cost-effective strategy in providing information to recipients as it costs only 20 centavos per text to the beneficiaries. In addition, NNC has a network of 50 community radio stations (*Nutriskwela*) through which nutrition messages are aired. NNC also has a digital radio program, One Nation One Nutrition, that tackles nutrition concerns as well as nutrition programs. This program has featured concerns on food fortification in connection with Food Fortification Day. All of these NNC nutrition education initiatives can be tapped for the promotion of rice fortification.

The *Tutok Kainan* Guidelines, including the conduct of nutrition education, can be used as a guide in the implementation of the feeding program at the LGU level when the program is transferred for LGU implementation.

The NNC is also formulating the Philippine Plan of Action for Nutrition (PPAN) 2023-2028 to guide nutrition action in the country. Part of this effort is the formulation of the Social and Behavior Change Communication Strategic Plan for the same period, which should provide the umbrella and guidance for related initiatives.

5.10 *Consumer view of nutrition and iron-fortified rice*

A mix of group interview and discussions was done in four public elementary schools in BARMM, particularly those that have used IFR in school feeding. The group interview and discussions were done together with the school feeding coordinators.

5.10.1 Profile of participants.

Almost all (98%) of the discussion participants are female. More than half (57%) belong to the 20-50 years age group and 37% are older than 50 years old. In terms of educational background, 29% are college graduates, 18% high school graduates, and the rest had lower levels of educational attainment. In terms of occupation, 58% are housewives, while about one-fourth (26%) teachers.

5.10.2 Source of information on nutrition and the Sangkap Pinoy seal

Top 3 sources of nutrition information and information on the *Sangkap Pinoy* seal were health center, television, and the internet.(Figure 8).

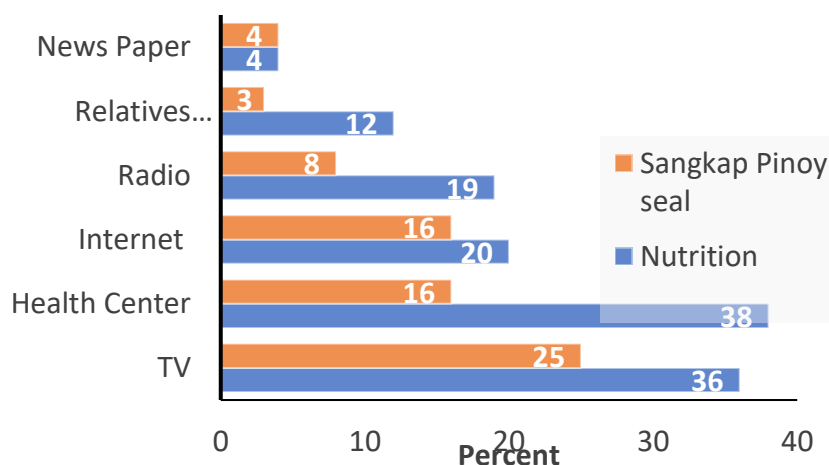


Figure 8. Source of information on nutrition and the *Sangkap Pinoy* seal

5.10.3 Perception of malnutrition

When asked on what malnutrition is, responses were: below normal weight, inadequate vitamins and minerals, weak physique, sickly, poor performance in schools and inadequate consumption of nutritious foods.

5.10.4 Sangkap Pinoy seal

As 88% said they know about micronutrient deficiency, only 43% are familiar with the Sangkap Pinoy seal. Only 52% said they bought products with the *Sangkap Pinoy* seal, but only 35% identified products with SPS correctly.

5.10.5 Rice concerns

The most common rice variety bought are Upi Rice, *Masipag* Rice, and R 160 rice. About ¼ of discussion participants (26%) buying NFA rice with a price range of P25 to P38 per kilo. **Those who bought commercial rice shelled out P36-P50 per kilo.**

About 80% of discussion participants knew about IFR. About 85% also said they have eaten IFR, with 87% saying it has a pleasant taste (“*masarap*” or tastes good), while 9% said it has unpleasant taste. About ¾ (74%) were aware that their children consumed IFR for the SBFP.

Almost all (91%) of the discussion participants said that they will buy IFR if it is available in the market even if it costs more than non-fortified rice. However, most (74%) are willing to pay P2.00 more.

After a short lecture on nutrition, micronutrient malnutrition, *Sangkap Pinoy* products, and rice fortification, all discussion participants said they will now buy products with *Sangkap Pinoy* Seal and IFR.

6.0 Analysis of results based on the objectives of the study

The analysis of the results according to the objectives of the study is based on information generated from the desk review, KIIs, and FGDs among the major stakeholders defined in the framework of the ecosystem of rice fortification in the Philippines (Figure 3 on page 13).

6.1 *Gaps to explain the low supply, acceptance, and consumption of iron-fortified rice.*

The low supply of IFR until about 2021 was due to the interplay of supply and demand.

The demand came primarily from SSNPs. For instance, IFR became available at a relatively large scale when the FSP of the AHMP (implemented from 2005 to 2010) requested NFA to deliver IFR. However, when the AHMP was discontinued with the change in administration in 2010, NFA stopped producing IFR except for a brief period to mop up its supply of IRK.

However, the experience in Region 1 and Davao de Oro showed how the interplay of supply and demand can be managed positively for increased availability and use of IFR in a locality.

In Region 1, Nutridense Food Manufacturing Corporation relentlessly advocated for the use of IFR in feeding programs, targeting for the purpose DepEd, local governments, and farmers cooperatives. The effort paid off and since 2017 a local school district has been using IFR. The promotion of IFR received a further boost when in 2019, the Region 1 Development Council (an organization of provincial governors, national government agencies, and selected NGOs in a region) called on “all government instrumentalities to patronize and promote the use of iron-fortified rice as a complementary strategy to address the iron deficiency problem of the populace” (Annex 11). The support of the DOST Regional Office and the Provincial Science and Technology Directors was also notable. With these elements, Region 1 is the most capable to implement rice fortification at least for its SSNPs with one IRK producer, two blending machine fabricators, three current producers of IFR with an additional five to be operational in 2022. Of the P85M of IFR procured by DepEd in 2021, P57.2M (67%) was procured in Region 1, with P52.8M being procured by Pangasinan Province. The Region 1 experience can be documented and shared with other regions for inspiration and adaptation.

On the catalytic role of LGUs, the Davao de Oro experience shows how LGUs can adopt rice fortification for rice distribution programs and facilitate the active collaboration among DepEd, the provincial government in providing funds for vehicles, salary of personnel of the central kitchen (for the school-based feeding) and other amenities and monitoring of implementation by an NGO, the *Gawad Kalinga*.

Unfortunately, the Region 1 and Davao de Oro experiences were not replicated in other parts of the country.

Thus, even if FNRI was successful in engaging initial IFR technology adaptors in 2013, i.e., CLG Corporation, Bagayas Rice Mill and Loronix Rice Mill (all in Mindanao), these adopters had to stop operations because there was no demand for IFR.

Low acceptance and consumption of IFR was evident when IFR produced with coated IRK was being used. There were complaints of discoloration of the rice, possibly related to the use of yellow-colored IRK with ferrous sulfate, and unpleasant taste. Similar feedback was received from recipients of IFR with coated IRK in the BangUN Program, which started in 2018. However, the FGDs with parents of children who participated in feeding programs that used IFR indicate positive experience with the rice, i.e., tastes good. Extruded IRK was used to produce IFR for these programs.

Communication campaign initiatives were very limited and localized. Communicators were not too keen on promoting IFR because of the low supply and the negative feedback on the taste and color of IFR. Nonetheless, a communications plan was formulated in 2016 (Annex 12) to mobilize rice millers, government, and consumers to use IFR. Information, education, and communication materials to promote IFR to LGUs and consumers were also developed in 2018 (Annex 13). Unfortunately, due to competing concerns, the 2016-developed plan was not implemented nor were the IEC materials distributed.

The landscape has changed with the passage of RA 11037 that calls for the use of fortified foods in feeding programs of DepEd and DSWD, the NNC Governing Board resolution calling for the use of IFR in SSNPs, and the initiative of the IATF-ZH in 2020 through the conduct of *Kumain* Webinars and support from DOST and technical assistance of FNRI. The demand for IFR has increased with the requirements of DepEd, suppliers of both IFR and IRK have also increased or have the potential to increase.

6.2 *Mapping of iron-rice fortification capacities and campaign initiatives of the Philippines*

Capacities for rice fortification from those currently operating and those that are being trained were identified including their production capacities both for IRK and IFR (Section 5.0).

Based on the mapping of producers for this year, local (closer to point of use) production of IFR is lacking in the Visayas and Mindanao. Local production of IFR is expected to improve in 2023 when NFA pursues its plan to fortify the fortification of 50% of its buffer stocks, and as all or some of the 25 groups that have requested FNRI for technology transfer become operational. IRK production is also expected to increase with 2 additional plants -- one in Bukidnon in Mindanao and 1 in Samar in the Visayas.

The importers of IRK and multi-nutrient fortified rice kernels can also provide the supply as their price is competitive to local IRK.

An emerging concern is on the production capacities of IRK and IFR producers being more than the demand if the requirements only of DepEd and DSWD are considered. The total IFR requirements of DepEd and DSWD (55,233 MT) are only 47.2% of the maximum production capacities of current and future IFR producers (116,928 MT).

Most of the campaign initiatives were implemented prior to 2015 and in areas with a supply of IFR. Nonetheless, there are resources, e.g., 2016 communications plan and IEC materials on IFR that can be starting points for communication campaign initiatives as capacities to produce IFR improve.

In addition, there are many possible entry points for promoting the consumption of IFR in existing government programs, e.g., DSWD 4Ps family development sessions, DepEd through the parent- teachers associations, NNC through the text manager solutions and *Nutriskwela*, to cite a few. A critical entry point is the Social Behavior Change Communication Strategic Plan 2023-2028 that is currently being formulated.

6.3 Supply chain issues that hinder the implementation of mandatory rice fortification

Using the supply chain management for IFR framework (Figure 9), the following are supply chain issues that hinder the implementation of mandatory rice fortification.

6.3.1 Demand. The current demand for IFR is limited to the requirements of DepEd and DSWD for their feeding programs. The NNC through its *Tutok Kainan* Program contributes to the demand but the program will be turned over eventually to LGUs as well as the DSWD SFP. An analysis of the supply of IFR vs demand from SSNP of DepEd SBFP and DSWD SFP shows the presence of the capacity to produce up to 181,440 MT of IFR, almost three times higher than the 55,233 MT of IFR needed by DepEd and DSWD. With this excess production capacity, there is a need to generate more demand from markets that have not been fully tapped such as SSNPs of NGOs; government institutions that use rice, e.g., hospitals, jails, care institutions; rice allowance benefits of some private corporations, and the commercial market.

6.3.2 Planning. As noted earlier, the timely availability of IRK was an issue with some of the IFR producers. While the capacity to produce the IRK for the immediate IFR requirements is present, the absence of a forecast of requirements prevented IRK producers to plan their production to be more responsive to IFR producers. The sole source of micronized ferric pyrophosphate, VitaChem Industries, has requested the Philippines, through its sole distributor, to give a forecast of requirements.

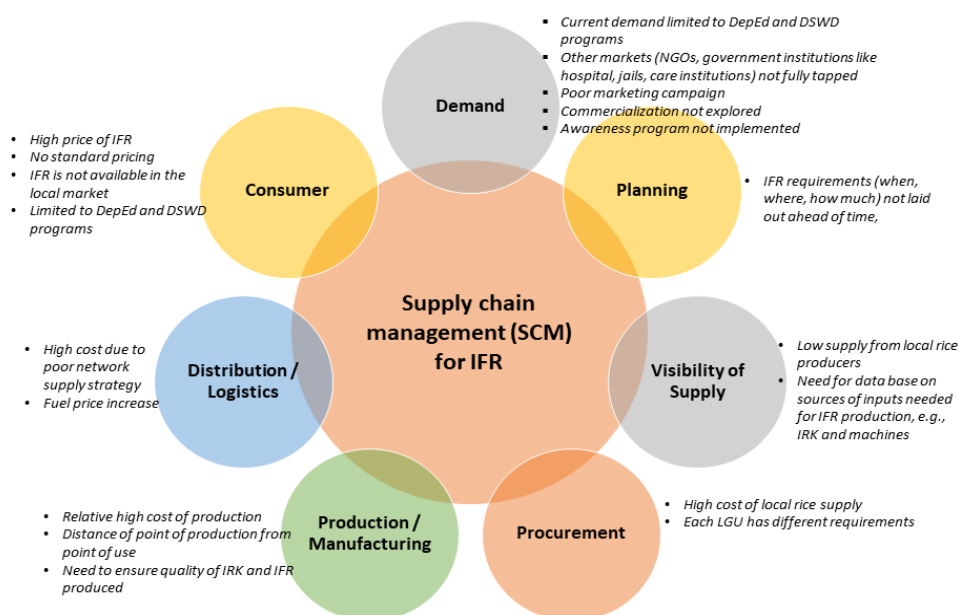


Figure 9. Supply chain challenges for rice fortification

- 6.3.3 **Visibility of materials supply.** Information on the resources needed for the production of IFR are readily available. This study consolidates all known information to date on who and where IRK producers and machine fabricators are. With FNRI and DOST regional offices providing financial and technical support to local IFR producers, it is safe to assume that local IFR producers will have access to information on where and how they can access IRK and machines for fortification. The creation, updating, and sharing of a data base on these resources is a necessity.
- 6.3.4 **Procurement.** The procurement of IFR follows the requirements of the procuring entity. Since government is a main procurement entity, government procurement processes are followed. Public bidding is the main procurement mode given the cost of the supplies needed. The DepEd procurement of IFR has been challenged with certain difficulties, e.g., some interested parties could not comply with the DepEd requirement for an FNRI certification (or TLA), the low price ceiling set by DepEd is not consistent with the cost of producing, packaging and transporting the IFR requirement, which prevented IFR producers from participating in the bidding.
- 6.3.5 **Production / manufacturing.** Total IFR capacity in 2022 is 181,440 MT/year or only 1.24% of Philippine rice consumption of 14.6 million MTs or 1.81% if farmers consumption is excluded which the difficulty in implementing mandatory rice fortification. A major concern on production is on the additional cost for producing IFR. Producers have estimated that producing IFR costs P4/kilo. This can be broken down to the cost of IRK at P375 – P450/kg depending on the distance related to the delivery cost as this already amounts to P1.88 to P2.25/kg to the cost of fortification while for blending cost, an IFR producer charges P65/50 kg IFR or P1.3/kg (profit included) in addition to the FNRI charge of 2% royalty fee or P0.9/kg if IFR cost is P45/kg. Based on this estimate, additional cost for producing IFR is P4 to P4.45/kg. This is about 10% of the cost of regular milled rice. This additional cost is also twice the additional price that FGD participants said they were willing to pay for IFR. Another issue on production is on the points of production not being evenly distributed in the country, particularly in Visayas and Mindanao. On quality assurance, the technical assistance and monitoring from FNRI and DOST to those with TLA gives a level of assurance that IRK and IFR production would be according to standards. For those without DOST support, FDA will be monitoring only those producing IRK. Currently, the issue on who will monitor producers and importers of rice is still being discussed between FDA, DA and DTI.
- 6.3.6 **Distribution / logistics.** There are facilities and service providers that will allow the movement of IRK and IFR from point of production to point of use. However, a main concern is on the cost of distribution. Since many of the IFR producers are based in Luzon, the cost of IFR in Visayas and Mindanao is expected to be higher given the cost of transport. Based on prevailing rates (Table 5), transporting IFR from Luzon can add P3-5 to each kilo of rice. This will increase the price of IFR by P7-9, which may prevent creating more demand for IFR.

Table 5. Cost of transporting rice from Luzon to Visayas and Mindanao

Destination	20-footer freight cost	Cost per bag	Cost per kilo
Cebu	54,840	137.10	2.74
Dumaguete	65,326	163.32	3.27
Iloilo	62,670	156.68	3.13
Bacolod	62,670	156.68	3.13
Tacloban	64,609	161.52	3.23
Davao	71,560	178.90	3.58
Cagayan de Oro	63,670	159.18	3.18
Butuan City	73,000	182.50	3.65
General Santos City	71,560	178.90	3.58
Zamboanga City	105,000	262.50	5.25

6.3.7 **Consumers.** As there is a need to increase consumer demand for IFR, as part of the communications plan, a social media campaign using the cost-effective **text manager solution** should be implemented given the Philippines being considered as the world’s text capital such that various information to promote on the benefits of IFR, availability, standard pricing can be disseminated. A model for this text manager solution was implemented by NNC as part of its *Tutok Kainan* project for pregnant women and children below 2 years old in various regions.

7.0 Conclusions and Recommendations

The following are concluded from this study:

- The low supply, acceptance, and consumption of IFR is the result of an interplay of various factors. The low supply can be attributed to low demand, which could be explained partly by the negative feedback on the discoloration and metallic taste of IFR produced using the coating technology. Because of the low supply, communication initiatives could not be undertaken as intensively as desired.
- However, recent policy and program developments, i.e., the passage of RA 11037 (2018) that among others mandates the use of fortified foods in feeding programs in public elementary schools and child development centers and the NNC Governing Board resolution on the use of IFR in SSNPs (2019); FNRI’s continued work on iron-rice fortification technology (that addressed the concerns on discoloration and taste) and its promotion; and DOST support have given iron-rice fortification a major push.
- Thus, by 2022, given the presence of 4 IRK producers and importers and 2 additional ones once their facilities become operational, and 23 IFR producers, the Philippines would have the capacity to produce IFR that can respond to the demand from government feeding programs in public elementary schools and child development centers.

- However, elements of the supply chain are challenged along the cost of production (incremental cost of P4.00 due to fortification, half of which is due to the IRK) and the cost of distribution and logistics since most of the IRK and IFR producers are in Luzon regions with only 2 currently in operation in Mindanao, and none in the Visayas.
- In addition, the estimated production capacity of IFR is five times higher than the requirements of ongoing national feeding programs which can threaten the sustainability and viability of IFR production as an economic activity.

Given these conclusions the following are recommended:

7.1 *Most Cost-Effective and Efficient Delivery of IFR to Target Recipients*

7.1.1 Explore ways to reduce the cost of fortification by about 50%, i.e., from P4.00 – P4.45/kg to P2-2.20 through:

- Use of lower-priced micronized ferric pyrophosphate. Currently the micronized ferric pyrophosphate being used from Taiyo Kagaku costs about P3,000/kg which is about 45% to 50% to the cost of IRK. Using micronized ferric pyrophosphate from China or India, which costs approximately P500/kg, is a big factor in reducing the cost of IRK.
- Reduction of the P65/50 kg blending cost as estimated by an IFR producer considering that that NFA charges only P35/50-kg IFR.
- Consideration of the recommendation to reduce or eliminate the requirement for IRK and IFR producers that adopt the FNRI technology to pay the FNRI royalty fee (currently being discussed)

7.1.2 Continue the use of an acid compound such as citric acid in producing the IRK as studies have shown that citric acid increases the solubility and absorption of ferric pyrophosphate making it more effective in delivering iron to targets.

7.1.3 Adopt the guiding principle to bring the site of production as close as possible to the site of use for more efficient distribution of IFR and for this purpose, focus on the Visayas and Mindanao.

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Along this line, the FNRI, as provider of assistance on technology, and DOST, as provider of funding support have an important gatekeeping function to ensure that IRK producers and IFR producers are relatively close to each other.

For instance, a working framework could be to have two IRK producers for Northern Luzon and Southern Luzon, one for Visayas, and two for the Mindanao (e.g., one for the eastern part and one for the western part); and one to two IFR producers per province depending on the size of a province. These IFR producers should be networked further with rice mills within a certain radius from the IFR producer. An equally overriding concern should be to ensure the sustainability of IRK and IFR production as a viable economic activity.

- 7.1.4 Continue conducting technology dissemination seminars but more strategically, targeting areas that do not have IRK and IFR producers.
- 7.1.5 Continue using the cheaper roll-on-roll-off transportation for interisland delivery
- 7.1.6 Pursue the aforementioned efforts with continued efforts to capacitate IRK and IFR producers to ensure fortification according to standards. Related to this is the need to resolve the issue on which government agency should monitor and regulate rice fortification. The concern can be brought up to the agencies concerned (DA, DTI) for resolution.

7.2 *Strategies for the Increased Consumption of IFR*

- 7.2.1 Expand the market for IFR as a first key strategy: Additional markets to consider include SSNPs of NGOs and LGUs, institutions like hospitals, jails, orphanages and the like, and private companies that provide rice allowance for its employees. In addition, commercial distribution should be considered reaching out not only to consumers but also to food service outlets like restaurants.
- 7.2.2 Issuance of agency / organizational policy instruments mandating or encouraging the use of IFR as follows:
 - DILG enjoying LGUs to use IFR in their feeding programs, disaster relief commodities, and other rice distribution programs
 - DOH requiring hospitals to use IFR in providing dietary services
 - DOLE encouraging companies to provide IFR as part of the rice allowance incentive or benefit, all other government agencies to use IFR in meals served for meetings, conferences, and workshops.
 - Regional development councils calling for the use of IFR in rice distribution programs in the region, with that issued by the Region 1 Regional Development Council as model
- 7.2.3 Adoption and enforcement of local ordinances (local laws) that require the use of IFR in SSNPs and food service outlets, and the availability of IFR in the market.
 - Ordinances adopted by La Union Province, Davao de Oro, and Davao City could be shared with LGUs.
 - This encouragement could be integrated in advocacy fora supported by related IEC materials. The importance of reaching out to LGUs cannot be overemphasized given the expected full devolution scenario in 2023. Under this set up, the feeding programs of DSWD and NNC will be decided on and managed by LGUs.

- 7.2.4 Reach out to NGOs on IFR through advocacy fora and the dissemination of IEC materials on the advantages of using IFR and on sources of IFR.

7.3 *Communication Strategies for Increased Knowledge and Acceptance of IFR*

- 7.3.1 Formulate and implement a communications plan on IFR and ensure its integration or inclusion in the PPAN Social and Behavior Change Communication Plan for 2023-2028.
- The promotion of the use and consumption of IFR would involve key communication strategies and should recognize that different target audiences (local chief executives, NGO program managers, rice millers, consumers) to be reached with specific messages to enable the adoption of desired behaviors. The experience in promoting IFR in Region 1 and in Davao de Oro could be documented and become resources for the communication plan.
 - Having a communications plan to cover the range of key target audiences for communication will help ensure a holistic approach. For this purpose, the 2016-developed communications plan (Annex 12) can be revisited and adapted.
 - Ensuring that IFR communication concerns are integrated in the overall social and behavior change communication plan for 2023-2028 will help ensure sustained implementation of related initiatives.
- 7.3.2 Highlight the benefits of using IFR especially in terms of improved learning capacity and improved work productivity to all target audiences.
- 7.3.3 To reach consumers, social media platforms should be used more rather than traditional media channels given the shifting behavior of consumers on use of these channels. The text manager solution or bulk messaging could be considered through which SMS messages are sent regularly to target audiences through various mobile networks.
- 7.3.4 Continue to use interpersonal communications by developing modules on IFR and integrating these in existing face-to-face nutrition education and related activities, e.g., in health centers during provision of health services, the family development sessions or parents' effectiveness sessions of DSWD and parent-teacher association meetings and orientations.

7.4 *Overall conclusion*

There is a fast and movement towards the increased production and consumption of IFR. This study has identified the capacities, supply chain and campaign initiatives on rice fortification and provided various recommendations related to maintain and further strengthen this momentum for rice fortification in the Philippines. Given the number of recommendations provided in this report, the next step would be the development of an interagency strategic and operational plan to be the basis for funding and implementing the Philippine Rice Fortification Program as a component of the Philippine Food Fortification Program. The planning could be initiated by the IATF-ZH and NNC with participants from various organizations from government, the non-government community, IRK and IFR producers, and LGUs.

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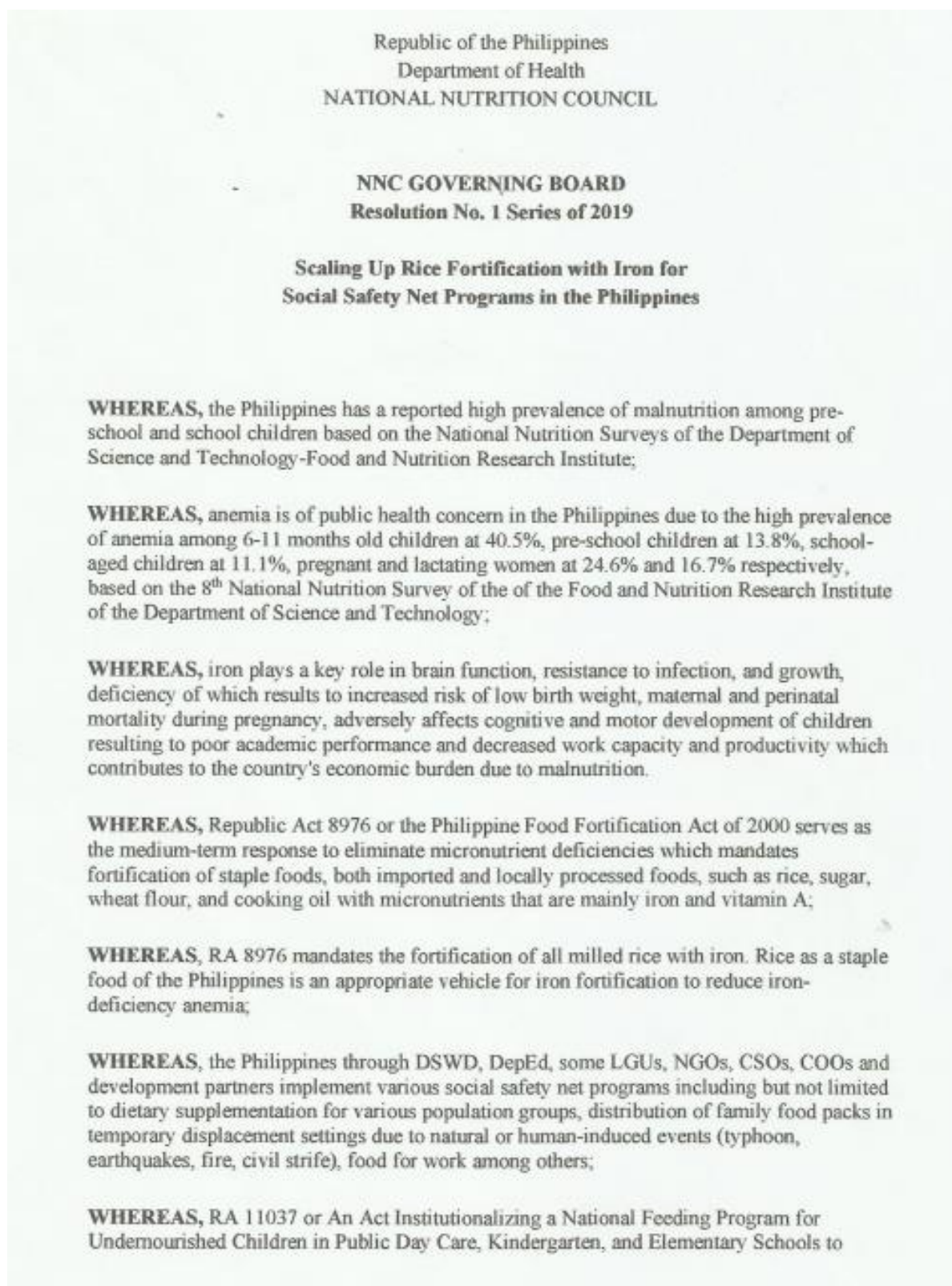
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Annexes

Annex I. NNC Governing Board Resolution No. 1 Series of 2019 – Scaling Up Rice Fortification with Iron for Social Safety Net Programs in the Philippines.



NNC GOVERNING BOARD
Resolution No.1 Series of 2019

**Scaling Up Rice Fortification with Iron for
Social Safety Net Programs in the Philippines**

Combat Hunger and Undernutrition Among Filipino Children, requires the provision of at least one fortified meal per day for 120 days for malnourished children in day care centers and public elementary schools, compliance to which will necessarily use iron-fortified rice.

WHEREAS, government-managed social safety net programs procure their rice requirements from NFA, which currently faces challenges in producing iron-fortified rice;

WHEREAS, these social safety net programs provide rice as a major commodity, but use of iron-fortified rice is currently negligible;

WHEREAS, efficacy trials of the Department of Science and Technology – Food and Nutrition Research Institute on iron-fortified rice showed the reduction of anemia among schoolchildren in the Philippines and provided evidences on high acceptability of iron-fortified rice;

WHEREAS, the model on scaling up rice fortification program through techno transfer of DOST-FNRI enabled private millers to acquire and adopt the technology in the production of iron rice premix and iron-fortified rice

WHEREAS, studies have shown that the current supply of iron rice premix and iron-fortified rice from the private sector, including cooperatives, can meet the requirements for these social safety net programs;

WHEREAS, iron-fortified rice provided as part of the Accelerated Hunger Mitigation Program from 2005-2010 may have contributed to the significant decrease in anemia prevalence in the general population from 30.6% in 1998 to 19.5% in 2008 to 11.1% in 2013 based on the National Nutrition Surveys of the Food and Nutrition Research Institute of the Department of Science and Technology;

NOW, THEREFORE, BE IT RESOLVED, AS IT IS HEREBY RESOLVED, in consideration of the aforementioned premises, we the NNC Governing Board do hereby declare the need for collective effort in scaling up the use of iron-fortified rice for social safety net programs of the Philippines for the control of anemia particularly for vulnerable groups;

RESOLVED FURTHER, that iron-fortified rice be used for social safety net programs that use rice as a commodity as implemented by DepEd, DSWD, DOH, LGUs and NGOs, and development partners;

RESOLVED FURTHER, for the NNC Secretariat in close coordination with the Sub-Technical Working Group on Mandatory Food Fortification, to undertake the following:

1. Support and work with NFA on its compliance to mandatory rice fortification as provided in RA 8976 and to this Governing Board Resolution

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Social Safety Net Programs in the Philippines**

2. Develop and implement an advocacy and communication effort to promote sale and consumption on the use of iron-fortified rice in the general population
3. Coordinate with government agencies, institutions and organizations that are not members of the NNC Governing Board, e.g. DAR that can be tapped to provide assistance on cascading the advocacy and promotion on the use of iron fortified rice for social safety net programs and NGOs.

RESOLVED FURTHER, to generate support of local chief executives to implement mandatory rice fortification through the enactment of related ordinances and to monitor compliance to these ordinances and provide reports thereafter on the compliance to these ordinances;

RESOLVED FURTHER, to promote the importance of rice fortification to the rice industry, beneficiaries of Pantawid Pamilyang Pilipino Program (4Ps), non-government organizations, and the general population;

RESOLVED FURTHER, for the following agencies to undertake the following specific actions:

The **Department of Health** shall issue a policy for all DOH hospitals, canteens, programs and projects that convene activities during which rice is served to use only iron-fortified rice; design and implement a promotional campaign on iron-fortified rice and explore the allocation of a budget for the iron-rice premix for use by NFA and other rice millers; Food and Drug Administration to set standards for rice fortification, including iron-rice premix and monitor quality and compliance in the production and importation of iron rice premix;

The **Department of Agriculture** through the National Food Authority shall develop its own policy to regulate millers, traders and retailers for the production of iron-fortified rice for government purchase, for social safety net programs and for the general population; enable their field personnel to assist in monitoring as provided by RA 8976 and promote rice fortification to farmers' groups and cooperatives.

The **Department of the Interior and Local Government** shall issue a policy instrument enjoining LGUs to: 1) use iron-fortified rice for their social safety net programs such as for disaster response and rehabilitation and for feeding programs and for use in their canteens, hospitals and meetings and to enact ordinances in support of rice fortification similar to the ordinances of the provinces of Compostela Valley Provincial Ordinance No. 29-2015 An Ordinance Providing Mechanisms For Use Of Iron-Fortified Rice In The Province Of Compostela Valley Known As Comval I-Rice and La Union Ordinance No. 118-2017 An Ordinance Providing Mechanisms for the Production, Distribution and Use of Iron-Fortified Rice or the "La-Union Fortified Rice Ordinance of 2017"; and 2) monitor rice fortification through their agricultural officers in coordination with NFA field personnel; and 3) promote rice fortification to farmers' groups and cooperatives;

**Scaling Up Rice Fortification with Iron for
Social Safety Net Programs in the Philippines**

The **Department of Education** shall issue an order on the use of iron-fortified rice for the School-Based Feeding Program; for school canteens to sell only iron-fortified rice, and promote the use of iron-fortified rice through Parent Teachers Associations.

The **Department of Social Welfare and Development** shall undertake the following activities for the implementation of Social Safety Net Programs:

1. For Supplementary Feeding Program –remove the requirement on the use of NFA rice to allow procurement from the private sector, require the use of iron-fortified rice particularly by LGUs that receive funds from the DSWD. The guidelines should include the list of suppliers of iron-fortified rice (as also included in the DepEd Guidelines).
2. For Disaster Preparedness and Response – Implement the memorandum on the revised composition of the family food pack that among others indicates the use of iron-fortified rice.
3. For the Rice Subsidy Program of the 4Ps – Include the promotion of iron fortified rice for the beneficiaries of 4Ps.
4. For Bangsamoro Umpungan sa Nutrisyon (BangUN) Program – Use iron-fortified rice in the supplementary feeding for children, pregnant and lactating mothers.

The **Department of Science and Technology** shall continue research to reduce the cost of fortification (i.e. cheaper iron fortificant, cheaper blending machines for millers) and continue to provide incentives through interest-free loan for investors for the production of iron-rice premix and iron-fortified rice; and provide technical assistance to rice industry on rice fortification.

The **Department of Trade and Industry** shall adopt a policy that would provide incentives for investors/producers of iron-rice premix and iron-fortified rice through the Investments Priority Plan. It shall also assist relevant micro- and small enterprises along rice fortification through its Shared Services Facilities Program.

The **National Economic and Development Authority** shall assist in identifying ways of incentivizing those who are compliant to mandatory fortification of rice and other staples, including salt.

The **Department of Labor and Employment** shall promote the use of iron-fortified rice in company rice subsidy for employees and company canteens to help improve work productivity.

The **non-government organizations** shall promote the use of iron-fortified rice to their respective clientele; adopt a policy on the use of only iron-fortified rice for those with programs that use rice; and assist in advocating for the enactment of ordinances in support of rice fortification (League of Municipalities of the Philippines), explore the provision of incentives to compliant industry players, assist in the advocacy for the provision of rice fortification budget to NFA (Philippine Legislators' Committee on Population Development).

NNC GOVERNING BOARD
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**Scaling Up Rice Fortification with Iron for
Social Safety Net Programs in the Philippines**

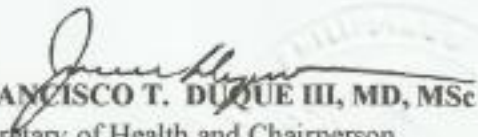
The **development partners** (i.e. relevant UN agencies and bilateral organizations that procure and provide milled rice as part of its programs) shall distribute only iron-fortified rice; All UN agencies and bilateral organizations shall support the promotion, sale and consumption of iron-fortified rice.

The **other national government agencies** shall promote the use of iron-fortified rice to their respective employees

RESOLVED FURTHER, for agencies concerned to implement their roles and responsibilities as provided for in Republic Act 8976, "An Act Establishing the Philippine Food Fortification Program and other purposes";

RESOLVED FURTHER, for the National Nutrition Council Secretariat to ensure that this policy is disseminated as widely as possible, implemented accordingly, and compliance to RA 8976 is monitored regularly with an annual report submitted and presented to the NNC Governing Board.

Approved this 15th day of February 2019.



FRANCISCO T. DUQUE III, MD, MSc
Secretary of Health and Chairperson
National Nutrition Council Governing Board

Attested:




AZUCENA M. DAYANGHIRANG, MD, MCH, CESO III
Council Secretary and Executive Director
National Nutrition Council

NNC GOVERNING BOARD
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Scaling Up Rice Fortification with Iron for
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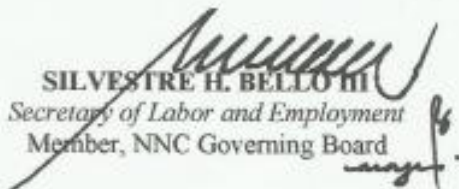

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Secretary of the Interior and Local Government
Vice-Chairperson, NNC Governing Board


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Secretary of Budget and Management
Member, NNC Governing Board






LEONOR M. BRIONES
Secretary of Education
Member, NNC Governing Board


SILVESTRE H. BELLO III
Secretary of Labor and Employment
Member, NNC Governing Board



FORTUNATO T. DELA PEÑA
Secretary of Science and Technology
Member, NNC Governing Board

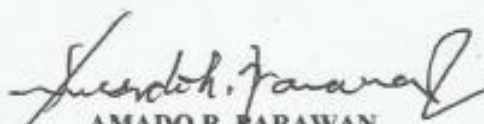

ROLANDO JOSEITO D. BAUTISTA
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Private Sector Representative to the
NNC Governing Board

Annex 2. FDA Circular No. 2007-010-A – Updated Standards for Iron-Rice Premix Amending Bureau Circular No. 2007-010



Republic of the Philippines
Department of Health
FOOD AND DRUG ADMINISTRATION



FDA CIRCULAR
No. 2007-010-A

22 DEC 2021

SUBJECT : **Updated Standards for Iron-Rice Premix Amending Bureau Circular No. 2007-010 entitled “Guidelines in the Initial Issuance and Renewal of License To Operate for Iron Rice Premix Manufacturer/Repacker/Importer and Setting Forth the Standards for Iron Rice Premix”**

I. BACKGROUND

Pursuant to Republic Act (RA) No. 8976 entitled *An Act Establishing the Philippine Food Fortification Program and for Other Purposes*, particularly iron fortification of rice to achieve its goal of addressing Iron Deficiency Anemia (IDA), the subject Bureau Circular No. 2007-010 entitled *“Guidelines in the Initial Issuance and Renewal of License To Operate for Iron Rice Premix Manufacturer/Repacker/Importer and Setting Forth the Standards for Iron Rice Premix”* needs to be revised to ensure the iron content in *iron-rice premix* is at the suitable level to help curb IDA in the country.

Rice fortification includes the addition of highly concentrated iron-rice premix to raw rice at required mixing ratio to enable the iron-fortified rice to be within the standard. During the enactment of the law in 2000, the technology available for the production of iron-rice premix was coating rice with iron to produce the premix. This technology was used as the basis for the standard of iron fortified rice as well as in the BFAD Circular No. 2007-010 subject of this revision. While the use of coating technology for the preparation of iron-rice premix has improved over time to reduce iron losses during the usual washing prior to cooking and to produce kernels that meet nutrient retention requirements under different conditions and preparation methods, an evolving technology such as extrusion is an additional option for iron-rice premix fortification. The Food and Nutrition Research Institute (FNRI) of the Department of Science and Technology has developed an extrusion technology for the production of iron-rice premix. The iron-rice premix produced by extrusion has minimal loss of iron during washing of rice prior to cooking. Studies of FNRI also showed that iron-rice premix produced by extrusion is efficacious.

Establishing a common standard of iron content of iron fortified rice using either the coating or extruding technology for iron fortified premix is unlikely, thus a computed

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iron level of raw and cooked fortified rice using extruded and coated iron-rice premix per blending ratio as a standard level of iron in the iron-rice premix is established.

Based on the foregoing, the amendment of Bureau Circular No. 2007-010 is hereby imperative.

II. OBJECTIVES

This Circular aims to provide guidelines on updated standards in the manufacture, repack, and/or import of iron-rice premix to help address iron deficiency anemia in the country.

III. SCOPE

This Circular shall cover person(s) or establishment(s) that manufacture, repack and/or import iron-rice premix used as an ingredient for iron fortification of rice as provided in RA No. 8976.

Further, this Circular shall be applicable as guidance to all Food and Drug Regulatory Officers under the Regional Field Offices in conducting evaluation and inspection of iron-rice premix manufacturer/repacker/importer for the initial issuance and renewal of License to Operate.

IV. DEFINITION OF TERMS

For the purpose of this issuance, the following terms shall mean:

- A. Food Additives** – refers to any substance not normally consumed as a food by itself and not normally used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which to food for a technological (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food results, or may be reasonably expected to result (directly or indirectly), in it or its by-products becoming a component of or otherwise affecting the characteristics of such foods. The term does not include contaminants or substances added to food for maintaining or improving nutritional qualities.

- B. Food Standard** – regulatory guideline that defines the identity of a given food product (i.e. its name and the ingredients used for its preparation) and specifies the minimum quality factors and when necessary, the required fill of the container. It may also include specific labeling requirements generally applicable to all prepackaged foods.
- C. Fortificant** – a substance, in chemical or natural form, added to food to increase its nutrient value.
- D. Fortification** – the addition of nutrients to processed foods or food products at levels above the natural state. As an approach to control micronutrient deficiency, food fortification is addition of a micronutrient, deficient in the diet, to a food which is widely consumed by specific at-risk groups.
- E. Good Manufacturing Practices (GMP)** – a quality assurance system aimed at ensuring that products are consistently manufactured, packed, repacked or held to a quality appropriate for the intended use. It is thus concerned with both manufacturing and quality control procedures.
- F. Ingredient** – means any substance, including a food additive, used as a component in the manufacture or preparation of food and present in the final product (in its original or modified form).
- G. Kernel Shavings** – very thin kernels or randomly sized or shaped clumps of dried extruded iron-rice premix.
- H. Labeling** – means any written, printed or graphic matter (1) upon any article or any of its container or wrappers or (2) accompanying the packaged food.
- I. Lot/Batch** – refers to quantity of food produced under essentially the same conditions during a particular production schedule.
- J. Lumped Kernels** – a kernel, thin kernel, and/or shaving that merged to form a large lump; some may look like enlarged whole kernels.
- K. Moisture Content** – the percentage weight of water in relation to the dry weight of the product.
- L. Packaging** – refers to an activity where a product is contained AND SEALED with the intention of storage and/or transport.

M. Thin Kernel – kernel with only half the size of a whole kernel or is crescent-shaped.

N. Whole Kernel – kernel with shape and size similar to well-milled rice; most prominent shape or size throughout the iron-rice premix.

V. GUIDELINES

A. The procedures and requirements for Licensing and Inspection of iron-rice premix manufacturer/repacker/importer shall be consistent and in accordance with the following:

1. Updated standards for iron-rice premix stipulated in the Annex A; and
2. Computed iron level of raw and cooked fortified rice using extruded and coated iron-rice premix per blending ratio in Annex B of this issuance;
3. Administrative Order (AO) No. 2014-0029 entitled *Rules and Regulations on the Licensing of Food Establishments and Registration of Processed Food, and Other Food Products, and For Other Purposes*;
4. AO No. 2020-0017 entitled *Revised Guidelines on the Unified Licensing Requirements and Procedures of the Food and Drug Administration Repealing Administrative Order No. 2016-0003*; and
5. AO No. 153 s. 2004 entitled *Revised Guidelines on Current Good Manufacturing Practice in Manufacturing, Packing, Repacking, or Holding Food* or latest amendments and pertinent rules and regulations containing the specific procedures of FDA.

B. Food establishments and other concerned personnel covered by the Scope of this Circular shall remain knowledgeable and updated in every provision of the said AOs and above-mentioned requirements and other pertinent rules and regulations.

VI. PENALTY CLAUSE

Any establishment found to be in violation of any provision of this issuance shall be a ground for disapproval of application and suspension or cancellation of License or Authorization pursuant to Section 4, Article 1, Book II of the Implementing Rules and Regulation (IRR) of RA No. 9711.

Notwithstanding the preceding paragraph, nothing in this section shall restrict the FDA in imposing the penalty and sanctions as prescribed under RA No. 8976 otherwise known as "Philippine Food Fortification Act of 2000" and its IRR.

VII. SEPARABILITY CLAUSE

If any provision of this Circular, or application of such provision to any circumstances, is held invalid, the remainder of the provisions of this Circular shall not be affected.

VIII. REPEALING CLAUSE

Provisions of previous issuances such as Bureau Circular (BC) No. 2007-010 which are contrary to those reflected hereon are modified/amended and/or repealed accordingly.

IX. EFFECTIVITY

This Circular shall take effect after fifteen (15) days following its publication in a newspaper of general circulation and upon filing three (3) certified copies to the University of the Philippines Law Center.


ROLANDO ENRIQUE D. DOMINGO, MD
Director General

DTN 20211006083010

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UPDATED STANDARDS FOR IRON-RICE PREMIX

I. SCOPE

This standard applies to iron-rice premix for domestic market distribution intended for human consumption.

II. DESCRIPTION OF THE PRODUCT

Iron-Rice Premix shall be made from rice and food grade ferrous sulphate, or (micronized) ferric pyrophosphate or any FDA Approved iron fortificant stipulated in the AO No. 4-A s. 1995 and food grade binders and additives sufficient to ensure quality, efficacy, and shelf life stability at ambient conditions and shall be packed in any suitable packaging material that could prevent the entry of moisture and contaminants

III. COMPOSITION AND QUALITY FACTORS

A. General Requirements

Iron-rice premix shall have the following characteristics:

1. Iron Content

The product shall contain a minimum of 300 mg iron (Fe)/100 grams (g) and a maximum of 2,400 mg Fe/100 g provided that the mixing ratio of not less than 1:100 up to not more than 1:400 is indicated in the label resulting in an iron content of 2 to 6 mg Fe/100 g of raw (uncooked) iron fortified rice and 0.6 to 2.2 mg Fe/100g of cooked iron fortified rice. For further information on how to arrive at values: see Annex B for reference in terms of proportion and the availability of iron in raw and uncooked iron fortified rice also considering the losses during washing.

2. Moisture Content

The product shall have a maximum moisture content of 13%.

3. Color
The iron-rice premix shall have light yellow to yellow color based on the prevailing scientific reference.
4. The iron rice kernels shall be composed of at least 85% whole kernels and not more than 15% off-shaped kernels, namely: lumped, thin-shaped, and/or shavings.
5. No rancid-like odors.
6. Free from insects, filth and other extraneous matter.

IV. FOOD ADDITIVES

Food additives when used shall be in accordance with the current regulations established by the Food and Drug Administration i.e. BC 2006-016: Updated List of Food Additives or latest revision, updated CODEX STAN 192-1995 on General Standards for Food Additives or latest revision.

V. HYGIENE

- A. It is recommended that the Iron-Rice Premix covered by the provision of this standard shall be prepared and handled in accordance with the appropriate sections of the DOH A.O. No. 153 s. 2004 entitled "*Revised Guidelines on Current Good Manufacturing Practice in Manufacturing, Packing, Repacking, or Holding Food*" and recommended International Code of Practice – General Principles of Food Hygiene (CXC 1-1969, Revised 2020) or latest revisions.
- B. When tested by appropriate methods of sampling and examination, the iron-rice premix shall conform with the specific safety criteria in Table 1 and Table 2.

Table 1. Limit for Microorganisms and Contaminant in Iron-Rice Premix

Test Parameters	n	c	m	M
Molds and Yeast count, cfu/g	5	2	10 ³	10 ⁴
Aflatoxin, Total (ppb)	10			
Reference: (MR26) USDA Commodity Requirements Milled Rice and Fortified Milled Rice for Use in International Food Assistance Programs Effective Date: 13 July 2018				

Table 2. Maximum Level for Arsenic, Cadmium, and Lead in Iron-Rice Premix

Test Parameters	Maximum Level (ML) mg/kg
Arsenic	0.2
Cadmium	0.4
Lead	0.2
Reference: (PNS/BAFS 194:2017) General Standard for Contaminants and Toxins in Food and Feed	

VI. PACKAGING

The packaging material shall provide adequate product protection against the entry of moisture and adequate strength to withstand normal handling condition e.g., opaque polyethylene or polypropylene plastic and aluminum stand up pouches.

VII. STORAGE CONDITION

The product shall be stored in a cool dry place under 30 to 34 degrees Celsius with relative humidity not greater than 85%, away from ultraviolet light. The premises, warehousing, and distribution should be in accordance with AO No. 153 s. 2004 or its latest version.

VIII. LABELING

A. Each container shall be handled and marked with the following information or in accordance with A.O. No. 2014-0030 entitled "*Revised Rules and Regulation Governing the Labelling of Prepackaged Food Products Further Amending Certain Provisions of Administrative Order No. 88-B s. 1984*" or its latest amendments:

1. The name of the product shall be "Iron Coated Rice Premix" or "Iron Extruded Rice Premix" in accordance with the method of fortification used and shall be prominently and legibly indicated on the label of Iron-Rice Premix.
2. The brand name and/or trademark.

If the establishment has a registered brand name or trademark, it shall be mandatory to declare the brand name or trade mark. May not be declared on the label if the product will be used for further processing.

3. The complete name and address of the manufacturer, packer and distributor.
4. Open date marking.

The words "Expiry" or Expiry Date"/ "Use-by-date"/ "Consume Before Date (Recommended last consumption date)" indicating the end of period at which the product shall retain its optimum quality attributes at defined storage conditions.

Expiration/expiry date shall be printed clearly, conspicuously and legibly on all product labels in the following order: Day, Month, Year. The declaration of day and year are numerical while the declaration of month must be in words to avoid confusion (e.g., Expiry date: 01 January 2012 or 01Jan12).

5. Lot/Batch identification code.
6. The words "Product of the Philippines" or the country of origin, if imported.
7. Complete list of ingredients specifying the type of iron fortificant used.
8. Instruction for use including mixing ratio.

9. The statement "This product is not suitable for direct human consumption" shall be indicated on the label conspicuously in big and BOLD letters.
 10. Net weight shall be in International System of Units (SI Units).
 11. Storage instructions.
 12. Specific iron content.
- B.** The ink of the label graphics shall not smear or wear off upon contact with any liquid and/or hard surface.

IX. METHODS OF ANALYSIS AND SAMPLING

A. Determination of Iron Content

According to the AOAC Official Method of Analysis (2019) 21st Edition, AOAC 975.03; AOAC Official Method of Analysis (2019) 21st Edition, AOAC 944.02.

B. Determination of Moisture Content

According to AOAC Official Method of Analysis (2019), 21st Edition, AOAC 945.38B; AOAC Official Method of Analysis (2019) 21st Edition, AOAC 925.10.

C. Determination of Aflatoxin

ELISA Method or Liquid Chromatography Method.

D. Determination of Heavy Metals

Atomic Absorption Spectrophotometric Method.

E. Method of Sampling

Sampling plan shall be in accordance with the Codex General Guidelines on Sampling CAC/GL 50-2004.

Computed Iron Level of Raw and Cooked Fortified Rice Using Extruded and Coated Iron-Rice Premix per Blending Ratio

Premix	Computed iron level of Iron Rice Premix (IRP), mg iron/100g based on revised FDA standard (300-2400 mg/100g)																							
Mixing ratio	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400		
Raw IFR	Computed iron level of raw iron fortified rice (IFR) based on revised FDA standard (2-6 mg/100g)																							
1:100	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00		
1:200	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00	10.50	11.00	11.50	12.00		
1:300	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00	5.33	5.67	6.00	6.33	6.67	7.00	7.33	7.67	8.00		
1:400	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00		
Cooked Extruded IFR-FP	Computed iron level of cooked IFR based on the retention data of extruded micronized dispersible Ferric Pyrophosphate (FNRI-DOST and ILSI Project) (minimum of 0.6 mg/100g)																							
1:100	1.25	1.66	2.08	2.49	2.91	3.32	3.74	4.15	4.57	4.98	5.40	5.81	6.23	6.64	7.06	7.47	7.89	8.30	8.72			10		
1:200	0.63	0.83	1.04	1.25	1.45	1.66	1.87	2.08	2.28	2.49	2.70	2.91	3.11	3.32	3.53	3.74	3.94	4.15	4.36			5		
1:300	0.42	0.55	0.69	0.83	0.97	1.10	1.25	1.38	1.52	1.66	1.80	1.80	2.08	2.21	2.35	2.49	2.63	2.76	2.91			3.3		
1:400	0.31	0.42	0.52	0.62	0.73	0.83	0.93	1.04	1.14	1.25	1.35	1.45	1.56	1.66	1.76	1.87	1.97	2.08	2.18			2.5		
Cooked Extruded IFR-FS	Computed iron level of cooked iron fortified rice (IFR) based on the retention data of extruded Ferrous Sulfate (FNRI-DOST and ILSI Project) mg iron/100g																							
1:100	1.17	1.56	1.95	2.33	2.72	3.11	3.50	3.89	4.28	4.67	5.06	5.45	5.84	6.22	6.67	7.00	7.39	7.78	8.17			9.4		
1:200	0.59	0.78	0.97	1.17	1.36	1.56	1.75	1.95	2.14	2.33	2.53	2.72	2.92	3.11	3.31	3.50	3.70	3.89	4.08			4.7		
1:300	0.39	0.52	0.65	0.78	0.91	1.03	1.17	1.30	1.42	1.56	1.68	1.68	1.95	2.07	2.20	2.33	2.46	2.59	2.72			3.1		
1:400	0.29	0.39	0.49	0.58	0.68	0.78	0.88	0.97	1.07	1.17	1.26	1.36	1.46	1.56	1.65	1.75	1.85	1.95	2.04			2.3		
Cooked Coated IFR-FS	Computed iron level of cooked iron fortified rice (IFR) based on the retention data using coated ferrous sulfate (FNRI-DOST and ILSI Project), mg iron/100g																							
1:100	0.97	1.29	1.61	1.93	2.25	2.58	2.90	3.22	3.54	3.86	4.19	4.51	4.83	5.15	5.47	5.80	6.12	6.44	6.76			7.7		
1:200	0.48	0.64	0.81	0.97	1.13	1.29	1.45	1.61	1.77	1.93	2.09	2.25	2.42	2.57	2.74	2.90	3.06	3.22	3.38			3.9		
1:300	0.32	0.43	0.54	0.64	0.75	0.86	0.97	1.07	1.18	1.29	1.39	1.39	1.61	1.72	1.82	1.93	2.04	2.14	2.25			2.9		
1:400	0.24	0.32	0.40	0.48	0.56	0.64	0.72	0.81	0.89	0.97	1.05	1.13	1.21	1.29	1.37	1.45	1.53	1.61	1.69			1.9		

For details, refer to Annex A, Section III. 1. a. Iron Content

Annex 3. List of key informant interviews conducted

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers
March 15, 2022	Jeorge Aguilar Commercial Center/Nutrition and Beyond	Face-to-face	Jeorge Aguilar	0917-6201887	1. Hector Maglalang 2. Kristoffer Dela Cruz
March 18, 2022	Department of Science and Technology (DOST) Region XI	Zoom	Grace Ricardo	-	1. Hector Maglalang 2. Kristoffer Dela Cruz 3. Jesus Jose Maria Bombasi 4. Marcela Saises 5. Maria Lourdes Vega 6. Fabiola Allysa Bringas
			Laarnie D. Albacite	ldalbacite@region11.dost.gov.ph	
			Kenneth Barroga	-	
	Loronix Rice Mill		Gaspar Lorono	0920-4129151 gapslorn@gmail.com	
Antofel Trading/Saavedra Rice Mill	Ricardo Saavedra	0948-7305736 0920 906 5332 cardingsaavedra@gmail.com			
March 19, 2022	Nutridense Food Manufacturing Corporation		Racky Doctor	0923-7032198 0999-7290234 0916-6418611	
March 22, 2022	Food Baskets Corporation	Zoom	Arnel Pantaleon – QA Manager	arnel.pantaleon@foodbasketscorp.com	7. Hector Maglalang 8. Kristoffer Dela Cruz 9. Jesus Jose Maria Bombasi 10. Marcela Saises 11. Maria Lourdes Vega 12. Fabiola Allysa Bringas
			Ramon Santos – Sales and Logistics Department (Commissary)	-	
	Mundo Engineering Works		Edmundo Jacalan – Owner	mundoengineering2021@gmail.com	
			Hanna Jacalan - Owner		
	DSM	Face-to-face	Jane Chen	Jane.Chen@dsm.com	1. Hector Maglalang 2. Kristoffer Dela Cruz 3. Jesus Jose Maria Bombasi

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers	
March 23, 2022	DOST National Capital Region (NCR)	Zoom	Albei Keith Tolete – Food Technologist	ncr@dost.gov.ph	<ol style="list-style-type: none"> Hector Maglalang Kristoffer Dela Cruz Jesus Jose Maria Bombasi Marcela Saises Maria Lourdes Vega Fabiola Allysa Bringas 	
			Elvin Almazar	almazarelvin@gmail.com		
	Pateros Municipal Nutrition Committee		Meizl Sincuya – Municipal Nutritionist Dietitian	meizlsincuya@gmail.com paterosnutrition@gmail.com		
HDN Technology and Resources, Inc.	Aileen Ursolino – CAD Designer	hdn_metalfabrication@yahoo.com aileen_hdncad@yahoo.com				
March 24, 2022	CamSur Multi Purpose Cooperative	Zoom	Annielen L. Panerio – General Manager	camsur.mpc@gmail.com Tel # 0931-783-2295 (TNT) , 0936-921-0344 (Globe)		<ol style="list-style-type: none"> Marcela Saises Fabiola Allysa Bringas
March 29, 2022	DOST Region X	Zoom	Virgilio Mapa Fuertes – DOST X	-		<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi Marcela Saises Maria Lourdes Vega
			Ritchie Mae Guno – DOST X	-		
	National Food Authority (NFA)		Elimar C. Regindin – Department Manager and Team, Operations Coordination Department	administrator@nfa.gov.ph, ocd@nfa.gov.ph		
			Engr. Eva Castillejo – TSD, Division Manager	-		
			Jocelyn	-		
March 30, 2022	National Nutrition Council – Central Office	Zoom	Rita Papey – Deputy Executive Director	rita.papey@nnc.gov.ph joan.labita@nnc.gov.ph oed_nnc@yahoo.com	<ol style="list-style-type: none"> Hector Maglalang Kristoffer Dela Cruz Jesus Jose Maria Bombasi Marcela Saises Maria Lourdes Vega Fabiola Allysa Bringas 	

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers
	IMCD Philippines		Ma. Nancy S. Soyangco – Managing Director	0928 893 0789 Nancy.Soyangco@imcd.ph	<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi Marcela Saises Fabiola Allysa Bringas
			Eloisa De Leon – Nutritionist Dietitian	-	
			Sherryl Aguilar	-	
			Daisy Fernandez – Sales Executive, DSM promotions	Daisy.Fernandez@imcd.ph 0917-8127717	
March 31, 2022	Department of Social Welfare and Development (DSWD) Supplementary Feeding Program (SFP) Program Managment Bureau	Zoom	Mary Grace G. Flores – Nutritionist Dietitian III	(02) 931-8101 to 07 local 409 sfpc@dswd.gov.ph	<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi Marcela Saises Maria Lourdes Vega Fabiola Allysa Bringas
April 1, 2022	GTC Propack Corporation	Zoom	Alvin Joseph Alviar	sales01@gtcpropack.com hrd@gtcpropack.com	<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi Marcela Saises Maria Lourdes Vega Fabiola Allysa Bringas
April 4, 2022	WFP BARMM	Face-to-face	Mishael Argonza	0917 880 3135	<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi
	Bangsamoro Food Sufficiency Task Force (BFSTF)		Engr. Mohajirin T. Ali, MNSA, Director General, Bangsamoro Planning and Development Authority, Head of BFSTF Secretariat	-	
	National Nutrition Council BARMM		Dr. Kadil M. Sinolinding, Jr. DPBO, Regional Director	-	
	Tapayan-Tuka Irrigators Multi-Purpose Cooperative		Warda S. Sulaiman – Manager	0917 703 0038 0935 540 7129 sulaimanwarda938@gmail.com	<ol style="list-style-type: none"> Marcela Saises Kristoffer Dela Cruz

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers
			Rahib M. Ambac – Asst. Manager	0935 525 5868	
			Fatima S. Lurunoc - Cashier	0927 970 6228	
April 5, 2022	Datu Abdullah Sangki	Face-to-face	Mayor Samsodhen Ampatuan Sangki	aiocsiomilg@gmail.com	<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi
	Datu Abdullah Sangki School-Based Feeding Program (SBFP)		Gisela Tampus, RN – SBFP Coordinator	ma.gisela.tampus@deped.gov.ph	
			Jennifer Abesar	-	
			Maria Fe Hechanova	-	
			Amy Calibara	-	
			Veronica Silva	-	
			Marydith Belandres	-	
			Danesa Leal	-	
			Mary Grace Aguna	-	
			Mary Jane Hecnanova	-	
			Aileen Sibnga	-	
	Datu Saudi Ampatuan		Mayor Edris Asim Sindatok	adzmintan1995@gmail.com	
	Datu Saudi Ampatuan School-Based Feeding Program (SBFP)		Bryan Lovelace Demabildo, RN – SBFP Coordinator	bldemabildo16@gmail.com	
			Tata Latip	-	
			Ilabai Kamensa	-	
			Mary Jane Dimanicom	-	
			Hader Esmael	-	
			Bailyn Bitol	-	
			Amsurin Lumena	-	
			Haguiar Esmail	-	
	Alamain Ebrahim	-			
	Saida Amino	--			
	Salih Guimat	-			
	Alibai Anri	-			
	Suraina Usop	-			
	Sahada Menak	-			

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers	
	Al Rahman Farmers' Cooperative		Modrika A. Masukat	0977 206 6069	1. Kristoffer Dela Cruz 2. Marcela Saises	
			Rahib W. Mamaluba	0926 378 2322		
			Tauti A. Mines	-		
			Muhlisin Usap	0955 591 7656		
	Pamatuladan A Bayanihan Peoples Organization		Nanding R. Sayutin	0936 596 8901		
			Ali S. Luna	0921 318 9769		
			Mohidin U. Tungao	0926 462 1906		
	Talaposao Farmers Marketing Cooperative		Nhoman Tumba	0936 039 9054		
			Duri B. Kasim – Chairman	0916 173 8515	1. Kristoffer Dela Cruz 2. Marcela Saises	
			Norul-Izah B. Kasim	0936 318 1138		
			Adan G. Kaling	0905 132 0962		
			Omar U. Abdullah	0916 546 2438		
			Kagul B. Abdullah	0916 841 4344		
	Badurdin Anak		0916 218 6190			
	Department of Social Welfare and Drevelopment (DSWD) Disaster Response Management Bureau (DRMB)		Blended (face-to-face, Google Meet)	Soriya M. Malang	0916 173 8515	1. Maria Lourdes Vega 2. Fabiola Allysa Bringas
				Clifford Cyril Y. Rivalal – Bureau Director	drmb@dswd.gov.ph	
				Sittie Warda M. Moslem	-	
Trixcymae P. Bernal		-				
Mariel B. Ferrariz		-				
Corazon		-				
Mark Poul B. Agno		-				
Abigail Lorraine	-					

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers
	World Food Programme Philippines (WFP)		Carleneth S. San Valentin	Neth.sanvalentin@wfp.org	
April 6, 2022	City of Upi	Face-to-face	Mayor Ramon Piang Sr.	pdagara@yahoo.com	1. Hector Maglalang 2. Jesus Jose Maria Bombasi
	City of Upi School Based Feeding Program (SBFP)		Rhea Diosanta, RN – SBFP Coordinator	-	
			Analiza Maglasang	-	
			Rishain Escano	-	
			Elanie Dequito	-	
			Gina Salcedo	-	
			Jennyrose Sitjar	-	
			Margie Momalayag	-	
			Cristie May Solmerano	-	
			John Mark Managuit	-	
			Ma. Teresa Samtandor	-	
	Randy Pacio		-		
	Datu Blah Sinsuat		Mayor Datu Marshal Sinsuat	-	
	Datu Blah Sinsuat School Based Feeding Program (SBFP)		Myla Sinsuat, RN – SBFP Coordinator	mylasinsuat2017@gmail.com	
			Rogaya Ayunan	-	
			Aida Guignahan	-	
			Airah Ginalzali	-	
Ashria Magundanno		-			
Amina Adam		-			
Muslina Mama		-			
Asmaira Utto		-			
Lambaina Alim	-				
Alma Pangilinan	-				
Faeldonia Rice Trading (FRT)	Marie Antonette C. Faeldonia	0917 192 9677 frt_justinrice@yahoo.com	1. Kristoffer Dela Cruz 2. Marcela Saises		
	Rolando V. Uy	0917 528 9383			

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers
	Ministry of Science and Technology (MOST)		Minister Aida Silangar	-	1. Marcela Saíses
			Badria S. Lidasan	-	
			Vasrodin Buisan	-	
			Monawar Abdullah	0905 642 559	
			Abadradil Serde	-	
April 7, 2022	WFP BARMM	Face-to-face	Hasna Adam	0917 882 4798	1. Hector Maglalang 2. Jesus Jose Maria Bombasi 3. Kristoffer Dela Cruz 4. Marcela Saíses
			Mishael Argonza	0917 880 3135	
			Rolando V. Uy	0917 528 9383	
April 8, 2022	DSWD – Bangsamoro Umupungan sa Nutritisyon (BangUn)	Zoom	Rommel Teofilo Aguilar – DSWD Central Office National Program Monitoring Office for BangUn. Nutritionist-Dietitian supervising nutrition-related matters of the project	BangUn@dswd.gov.ph 0908 981 0981	1. Hector Maglalang 2. Kristoffer Dela Cruz 3. Jesus Jose Maria Bombasi 4. Marcela Saíses 5. Maria Lourdes Vega 6. Fabiola Allysa Bringas
April 11, 2022	Department of Education (DepEd) School Based Feeding Program (SBFP)	Zoom	Mei-ling Duhig – NFP National Focal Person	meiling.duhig@deped.gov.ph sbfp@deped.gov.ph	1. Hector Maglalang 2. Kristoffer Dela Cruz 3. Marcela Saíses 4. Maria Lourdes Vega 5. Fabiola Allysa Bringas
			Magdalene Cariaga – Senior Education Program Specialist	cherry.corpuz002@deped.gov.ph	
			Dr. Ma. Corazon C. Dumalao – Chief Health Program Officer, DepEd School Health Division	blss.shd@deped.gov.ph maria.dumlao@deped.gov.ph	
	Department of Science and Technology (DOST) Food and Nutrition Research Institute (FNRI)		Alexis Ortiz – Supervising Science Research Specialist	-	1. Hector Maglalang 2. Kristoffer Dela Cruz 3. Jesus Jose Maria Bombasi
	Abbie Padrones – Senior Science Research Specialist	abbie.padrones@yahoo.com			

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers
			Engr. Charlie Adona	-	4. Marcela Saises 5. Maria Lourdes Vega 6. Fabiola Allysa Bringas
	Alheed International		Nelvin Co – Vice President	0917-7350028 633-5892	1. Hector Maglalang 2. Jesus Jose Maria Bombasi 3. Marcela Saises 4. Maria Lourdes Vega 5. Fabiola Allysa Bringas
April 18, 2022	DOST Region 1	Zoom	Decth Libunao – CEST Project Lead	mail@region1.dost.gov.ph dplibunao@region1.dost.gov.ph	1. Hector Maglalang 2. Kristoffer Dela Cruz 3. Jesus Jose Maria Bombasi 4. Marcela Saises 5. Maria Lourdes Vega 6. Fabiola Allysa Bringas
			Jordan Abad – Regional Director	jlabad@region1.dost.gov.ph	
			Bernadine Suniega – Project staff	jmviernes@region1.dost.gov.ph	
April 19, 2022	Department of Health (DOH) Health Promotion Bureau (HPB)	Zoom	Edna Nito – HEPO IV, Capacity Building and External Relations Division	enito.hpcs@gmail.com hpb@doh.gov.ph	1. Hector Maglalang 2. Kristoffer Dela Cruz 3. Jesus Jose Maria Bombasi 4. Maria Lourdes Vega 5. Fabiola Allysa Bringas
	DOST Region VIII (Catarman, Northern Samar)	By phone	Engr. Veronica Aniban Laguitan	valaguitan@region8.dost.gov.ph 09981925726	1. Marcela Saises
April 20, 2022	DOST Technology Application and Promotion Institute (TAPI)	Zoom	Mylene Alano – Senior Science Research Specialist	info@tapi.dost.gov.ph m.alano@tapi.dost.gov.ph	1. Hector Maglalang 2. Jesus Jose Maria Bombasi 3. Marcela Saises 4. Maria Lourdes Vega 5. Fabiola Allysa Bringas

Date	Stakeholder	Channel	Respondent/s	Contact Details	Interviewers
May 2, 2022	Vitachem Industries	Zoom	Felix Co - President/General Manager/Technical Sales Head	T: +63 2 7759-8730 F +63 2 8929-8218 M: +63 917 534 4330 felix.co@vitachem.com.ph	<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi Marcela Saises Maria Lourdes Vega Fabiola Allysa Bringas
May 6, 2022	NNC – Nutrition Information and Education Division (NIED) and Nutrition Surveillance Division (NSD)	Zoom	Maria Renali Evangelista – NSD	renali.evangelista@nnc.gov.ph	<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi Kristoffer Dela Cruz Maria Lourdes Vega Fabiola Allysa Bringas
			Julia Los Baños - NSD	julia.losbanos@nnc.gov.ph	
			Genrev Esguerra - NIED	genrev.esguerra@nnc.gov.ph	
			Ellen Ruth Abella – OIC, NSD	ellen.abella@nnc.gov.ph	
	DSWD Pantawid Pamilyang Pilipino Program (4Ps)		Maria Teresa Janiz D. Aldea	mtjdaldea@dswd.gov.ph	
			Arvin Longcop – Project development officer	atlongcop@dswd.gov.ph	
WFP Better Access for Mothers and Babies on Integrated Nutrition Agenda (BAMBINA) Project	Dr. Ronald del Castillo – Consultant, Social and Behavior Change Communication (SBCC) UN WFP	ronald.delcastillo@wfp.org	<ol style="list-style-type: none"> Hector Maglalang Jesus Jose Maria Bombasi Marcela Saises Maria Lourdes Vega Fabiola Allysa Bringas 		

Annex 4. List of producers of iron-rice kernel (IRK)

Company/Contact Number	Plant Location/ Office	Type of Business	Source of Assistance (DOST/ Int'l Organization, etc.)	Type of Kernel	Process Used	Source of Product	Capacity kg/hr	Minimum Order, kg	Owner of Premix Technology	Status
Local Producers – Operational										
1. Nutridense Food Manufacturing Corporation (NFMC) 0999-7290234 0916-6418611 0923-7032198 nutridensefmc@yahoo.com.ph	Sta. Barbara, Pangasinan, Region 1	Food Manufacturer of Healthy, Nutritious Foods	Small Enterprises Technology Upgrading Program (SETUP)- DOST-1 1 Extruder Machine only	Iron Rice Kernel	Extruded	Locally Produced	80-100	Not answered in the interview	With License from DOST-FNRI	Operational
2. Nutrition and Beyond Corporation (NBC) 0917-6201887 jayjdaci@gmail.com	San Leonardo, Nueva Ecija, Region 3	Rice Mill	1. Grant from International Life Sciences Institute (ILSI)-CHP Japan Through The DOST-FNRI Market Trial Project of IFR in Bataan- 1-Complete Line Extrusion Machine but not Continuous line 2. Company Owned - Newly Purchased Extruder Machine	Iron Rice Kernel	Extruded	Locally Produced	30-50 100-150	100	With License from DOST-FNRI	Operational
3. Nutritional Food Processing Facility DOST-FNRI 837-3164 839-1836	Bicutan, Taguig City, NCR	Government Research Institution	DOST-TECHNICOM 1-Pilot scale Extruder Machine 1-Testing Extruder Machine	Iron Rice Premix and Multi-nutrient Rice Kernel	Extruded	Locally Produced	50-80 5-10	Facilities for rent only to Licensed Partners	DOST-FNRI	Operational

Company/Contact Number	Plant Location/ Office	Type of Business	Source of Assistance (DOST/ Int'l Organization, etc.)	Type of Kernel	Process Used	Source of Product	Capacity kg/hr	Minimum Order, kg	Owner of Premix Technology	Status
iangelesagdeppa@yahoo.com.ph 8372071 milflorg1013@yahoo.com			1-Complete Continuous Line Extruder Machine				80-100	Per hour basis		
Importers of Fortified Rice Kernels and/or Iron Rice Kernels										
1. Alheed International Trading Corporation 0917-7350028 8633-5892	Office - Pasig City, NCR	Importer rice premixes and agricultural Machineries	Company Owned	Iron Rice Kernel and multi nutrient rice kernel	Both Coated and Extruded	Imported from the Wright Group, USA	Not applicable	5,000	Wright USA	Awaiting orders
2. DSM Nutritional Products Philippines, Inc./IMCD 63-917-8652639 jan.chen@dsm.com candie.gagpanam@dsm.com	Office – DSM BGC, Taguig City, NCR, IMCD – Makati City	Importer of Chemical and Nutritional Products	Company Owned	Multi-nutrient Rice Kernel	Extruded	Imported from DSM Plant in Thailand	Not applicable	5,000	DSM	Awaiting orders
Local Producers -For training and testing, Awaiting Orders, Documents for Processing										
1. Loang LGU in partnership with Mainland Farmers' Producers Cooperative	Loang Northern Samar, Region 8	Farmers' Cooperative	CEST Program, DOST -8 1-Complete Continuous Line Extruder Machine	Iron Rice Kernel	Extruded	Locally Produced	80-100	Not yet available Waiting for the delivery of the equipt.	Under negotiation With DOST-FNRI	Processing of documents for bidding

Company/Contact Number	Plant Location/ Office	Type of Business	Source of Assistance (DOST/ Int'l Organization, etc.)	Type of Kernel	Process Used	Source of Product	Capacity kg/hr	Minimum Order, kg	Owner of Premix Technology	Status
2. Maramag Community Multi-Purpose Cooperative 09177701588 09177051460 vmfuentes@dost.cpm.ph Bukidnonregion10@dost.gov.ph	Maramag, Bukidnon, Region 10	Farmers' Cooperative	CEST Program, DOST - 10 1-Complete Continuous Line Extruder Machine	Iron Rice Kernel	Extruded	Locally Produced	80-100	Not yet available Awaiting for the delivery of the equipt.	For finalization DOST-FNRI License	Start July 2022
Stopped Production										
1. CLG Health Food, Inc.	General Santos City, Region 12	Family Food Business	SETUP, DOST-12 1-Complete Continuous Line Extruder Machine	Iron Rice Kernel	Extruded	Locally Produced	80-100	Not available	With License from DOST-FNRI	Stopped due to low demand

Annex 5. List of fabricators for rice fortification

Company/Contact Number	Address	Type of Business	Machine Offered for Rice fortification	Type of Product	With License from DOST-FNRI	Capacity/hour	Number of Machines Fabricated/ delivered
1. Mundo Engineering Works 0907-153-6748 0905-429-6619 mundoengineering2021@gmail.com	P-7 Poblacion Nabunturan, Davao de Oro	Welding and Machining Engine Reconditioning Machineries Fabrication etc.	Portable Blending Machine	Local	No (Has been part of the Project with DOST-FNRI on the scaling up of IFR in Mindanao)	30-40 bags of 50kg/hour of Iron Fortified Rice	4 Blending Machines
2. HDN Technology and Resources, Inc. (046) 482 0300 hdn_metalfabrication@yahoo.com 09175862071 aileen_hdncad@yahoo.com	B9, L-1C 5 th St., Golden Mile Bus Park Carmona, Cavite	Manufacturer of high-quality products made of STAINLESS STEEL & other metallic and nonmetallic material	Portable Blending Machine	Local	Yes (Equipment designed by DOST-FNRI)	30-40 bags of 50 kg/hour of Iron Fortified Rice	9 blending machines

Company/Contact Number	Address	Type of Business	Machine Offered for Rice fortification	Type of Product	With License from DOST-FNRI	Capacity/hour	Number of Machines Fabricated/delivered
3. GTC Propack Corporation Alvin Joseph Alviar 0998 977 5025 sales01@gtcpropack.com	GF KB VFP Bldg. C peter bilt Compound Veterans Center, Taguig City	Philippines' distributor of Food Processing, Packaging, and Pharmaceutical Machines	Continuous line Extruder Machine and Blending Machine	Imported	Not applicable (Importer)	80-120 kgs/hour of Iron Rice Kernel 30-40 bags of 50kg/hour of Iron Fortified Rice	5 extruder machines 1 blending machine
4. Alheed International Corporation 0917-7350028 633-5892	Unit 2701 Antel Global Corp. Ctr. Julia Vargas Ave., Ortigas Center, Pasig City	Importer of Grain Dryers, Rice Milling Machineries and fortified rice kernel	Blending Machine	Imported	Not applicable (Importer)	5 tons/hour	23 old (c/o NFA) + 4 new Blending Machines
5. Bestmark Agro-Industrial Corporation 0998 868 2838 bestmarkagro@gmail.com	151 Banaoang, Sta. Barbara, Pangasinan	Machine Fabricator	Blending Machine	Local	Not applicable (Company's design)	50bags of 50kg/hr	3
6. Felipe Pamintuan Machine Shop and Fabrication 0947 958 4447 0920 835 7879 0932407 2654	42 Brgy., Bugallon-Posada, San Carlos City, Pangasinan	Machining Solutions and Fabrication	Blending Machine	Local	Not applicable (Company's design)	50bags of 50kg/hr	1

Annex 6. List of producers of iron-fortified rice (IFR)

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
Operational										
1. Nutridense Food Manufacturing Corporation (NFMC) 0999-7290234 0916-6418611 0923-7032198 nutridensefmc@yahoo.com.ph	Region 1 - Sta. Barbara, Pangasinan	Food Manufacturer of Healthy, Nutritious Foods	2 Blending Machines	Mundo Engineering Works, Davao de Oro, and Felipe Pamintuan Machine Shop and Fabrication, San Carlos City, Pangasinan	Company Owned	RC 160 RC18	30-40 bags of 50 kg/hour 50 bags of 50 kg/hour Total of 4.5 Tons/hour	None	Yes	Operational
2. San Pablo Multi-Purpose Cooperative 0919-576-9519 0951-865-0246 0906-480-9877 macosta@region1.dost.gov.ph	Region 1 - Balaoan, La Union	Farmers' Cooperative	1 Blending Machine	Bestmark Agro-Industrial Enterprise, Sta. Barbara, Pangasinan	DOST SET-UP Region 1	Not mentioned during the interview	50 bags of 50 kg/hour	None	Yes	Operational

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
3. Tangcarang, Techno-Demo Farm 0908-895-4121 agricultureoffice_alaminoscity@yahoo.com	Region 1 - Alaminos City, Pangasinan	Local Government Unit (LGU)	1 Blending Machine	Bestmark Agro-Industrial Enterprise Sta. Barbara, Pangasinan	DOST Grant-In-Aid (GIA) Region 1	Not mentioned during the interview	50 bags of 50 kg/hour	None	Yes	Operational
4. Alheed International Trading Corporation 0917-7350028 633-5892	Region 2 – Isabela Province	Importer of Grain Dryers, Rice Milling Machineries, Blenders and fortified rice kernel	Big Blending Machine	Imported from Vietnam	Company Owned	Various	5 tons/hour	Yes	No Used Company's mixing technology	Operational
5. JD Aguilar Commercial, Inc. 0917-6201887 jayjdaci@gmail.com	Region 3 - San Leonardo, Nueva Ecija,	Rice Mill (Big)	Continuous blending machine	Imported	Company Owned	R64 Type Sinandoming Dinorado RC160	5 tons/hour	Yes	Yes	Operational

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
6. Food Baskets Corporation arnel.pantaleon@foodbasketscorp.com 0977 8332745 rds_ccbpi@yahoo.com	Region 4A - Antipolo City, Rizal	Engaged in Canteen Operations, Catering, Food Processing, Leasing, Toll Packaging and Restaurant Operations	Special blending packaging machine for 400g IFR	Imported	Company Owned	NFA Rice	Around 1,200 sacks per week or about 1.25 tons/hour	None	Yes	Operational
7. CamSur Multi-Purpose Cooperative 0936-921-0344 0917 5144796 09989851252 camsur.mpc@gmail.com	Region 5 - Zone 4 Cadlan, Pili, Camarines Sur	Farmers' Cooperative	1 Blending Machine	HDN Technology and Resources, Inc., Carmona, Cavite	No Assistance from DOST-Bicol Region Cooperative Funds	Triple 2, RC 216, hybrid	30-40 bags of 50 kg/hour	Yes	Yes	Operational
8. Antofel Trading or Saavedra Rice Mill	Region 11 - Mongkayo,	Rice Trader and Rice Mill	1 Blending machine	Mundo Engineering	DOST SET UP Region XI	Tonner	30-40 bags of 50 kg/hour	Yes	Yes	Operational

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
0948-7305736 0920 906 5332 cardingsaavedra@gmail.com	Davao de Oro			Works, Davao de Oro						
9. Faeldonia Rice Trading and FRT Rice Mill 0917 192 9677 0908-880-7795 frt_justinrice@yahoo.com	Region 12 - Noralá, South Cotabato	Rice Mill (Big)	2 Blending Machines	Imported from Taiwan	Company Owned	Tonner	5 tons/hour	Yes	Did not apply Used their own mixing technology	Operational
10. Nutritional Food Processing Facility, DOST-FNRI 837-3164 839-1836 iangelesagdeppa@yahoo.com.ph 8372071 milflorg1013@yahoo.com	Bicutan, Taguig City, NCR	Government Research Institution	2 Blending Machine	1-Satake machine Imported from Japan 1- HDN Technology and Resources, Inc., Carmona, Cavite	Foreign funded DOST-TAPI	Various	50 bags of 50 kgs/hr 30-40 kgs of 50kg.hr	No	Not applicable	Facilities for rent only to Licensed Partners Per hour basis Operational

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
With Equipment (for delivery, training, and calibration)										
1. JC Laroco Rice Mill 0925-871-0888 0917-719-7108 jennlaroco@yahoo.com	Region 1 - Lloren, Tubao, La Union	Rice Mill	1 Blending Machine	HDN Technology and Resources, Inc. Carmona, Cavite	DOST SET-UP Region 1	Variety not yet identified Production not yet started	30-40 bags of 50 kg/hour	Yes	Under negotiation	For delivery
2. Metro Bugnay Multi-Purpose Cooperative 09297885899 I 09178408203 09959708808 jlabad@region1.dost.gov.ph	Region 1 - Condon City, Ilocos Sur	Farmers' Cooperative	1 Blending Machine	HDN Technology and Resources, Inc., Carmona, Cavite	CEST-DOST-Region-1 LGU for the Building	Variety not yet identified Production not yet started	30-40 bags of 50 kg/hour	None	Under negotiation	Staff Trained and machine calibrated by DOST-FNRI conducted
3. Rice Millers and Traders Association of Cervantes 09162978835	Region 1 - Cervantes, Ilocos Sur	Rice Millers	1 Blending Machine	HDN Technology and Resources, Inc., Carmona, Cavite	CEST-DOST-Region-1	Special RC 160	30-40 bags of 50 kg/hour	Yes	Under negotiation	Staff trained and machine calibrated by DOST-

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
09178408203 09959708808 jlabad@region1.dost.gov.ph					LGU-for the Building					FNRI conducted
4. Vergara-Tagorda Rice Mill, Pangasinan 0939-914-6321 cesartagorda64@gmail.com pangasinan@region1.dost.gov.ph phacsantos@region1.dost.gov.ph 0998-962-0228	Region 1 - Quetegan, Mangatarem, Pangasinan	Rice Mill	1 Blending Machine	Bestmark Agro-Industrial Enterprise, Sta. Barbara, Pangasinan	DOST SET UP Region 1	Variety not yet identified Production not yet started	50 bags of 50 kg/hour	Yes	Yes	For calibration by DOST-FNRI
5. Palangue Agricultural Reform Cooperative 0926 011 7158 palarc@ymail.com 0935 329 8312	Region 4A - Palangue 2, Naic, Cavite	Farmers' Cooperative	1 Blending Machine	HDN Technology and Resources, Inc., Carmona, Cavite	DOST Grant-In-Aid (GIA)- Region 4A	Variety not yet identified Production not yet started	30-40 bags of 50 kg/hour	None	Under negotiation	For training and calibration

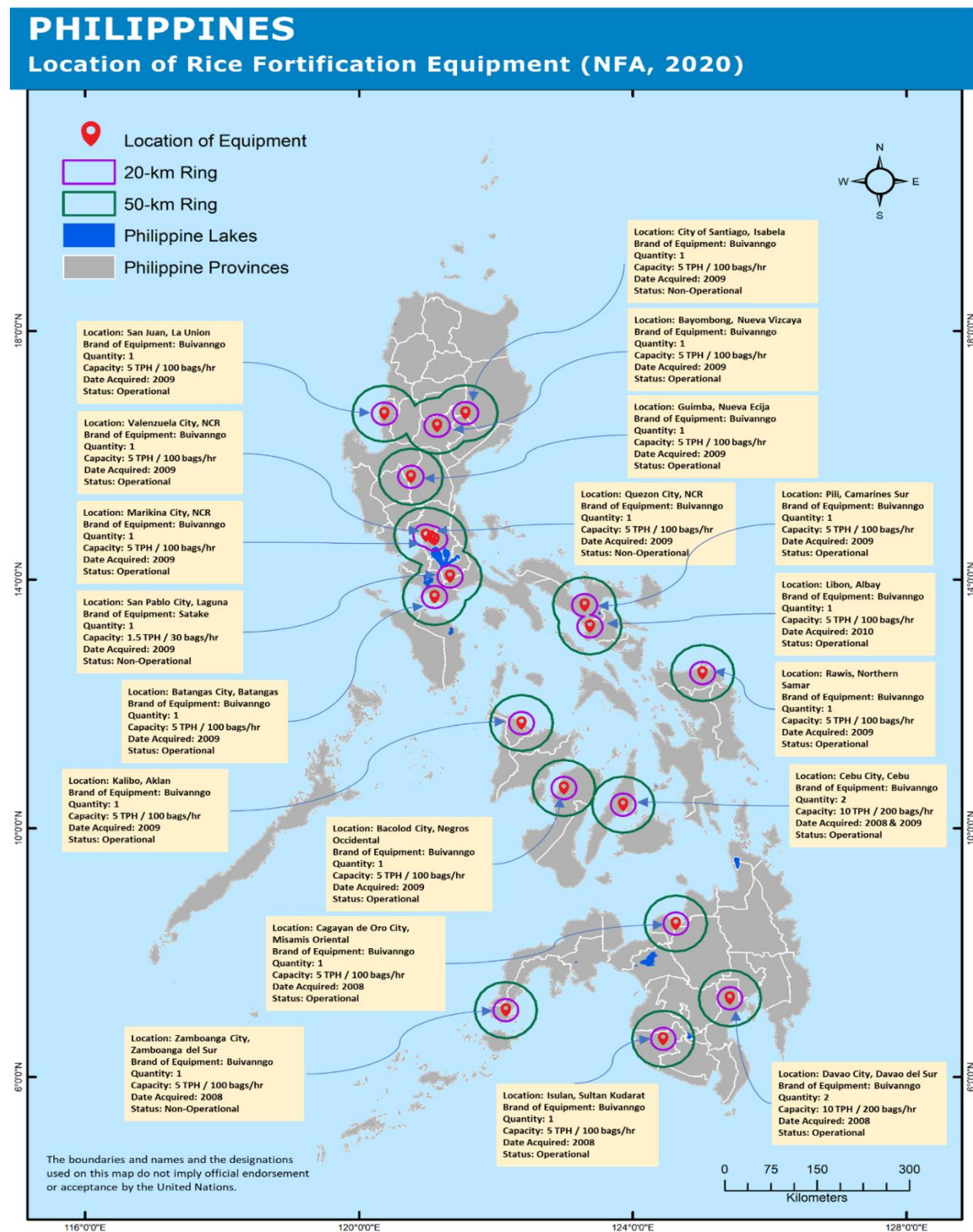
Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
pstccavitedost@gmail.com										
6. Maramag Community Multi- Purpose Cooperative 09177701588 09177051460 vmfuentes@dost.cpm.ph Bukidnonregion10@dost.gov.ph	Region 10 - Maramag, Bukidnon, Philippines	Farmers' Cooperative	1 Blending Machine	Imported from China through GTC Propack, Taguig City	CEST-DOST Region 12	White Tonner	30-40 bags of 50 kg/hour Automated with bucket conveyor	Yes	Under negotiation	For training and calibration by DOST-FNRI
7. Pateros Municipal Nutrition Office 09399364037 meizlsincuya@gmail.com atienzak178@gmail.com 0287726157 0285710403	NCR - LGU Pateros	Local Government Unit (LGU)	1 Blending Machine	HDN Technology and Resources, Inc., Carmona, Cavite	CEST Program of DOST-NCR	Variety not yet identified Production not yet started	30-40bags of 50kg/hr	None	Under negotiation	For training and calibration by DOST-FNRI

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
8. Navotas Livelihood Hanap buhay Center 09273127222 warredd@gmail.com 0287726157 0285710403 almazarelvin@gmail.com records@ncr.dost.gov.ph	NCR - LGU Navotas	Local Government Unit (LGU)	1 Blending Machine	HDN Technology and Resources, Inc., Carmona, Cavite	CEST-DOST-NCR	Variety not yet identified Production not yet started	30-40bags of 50kg/hr	None	Under negotiation	For training and calibration by DOST-FNRI
Others										
1. Ilocos Norte Cooperative 0917 5444357 dplibunao@region1.dost.gov.ph	Region 1 - Ilocos Norte	Farmers' Cooperative	1 Blending Machine	HDN Technology and Resources, Inc., Carmona, Cavite	CEST-DOST Region 1	Variety not yet identified Production not yet started	30-40bags of 50kg/hr	None	Under negotiation	Organizing Cooperative in Ilocos Norte
2. Mainland Farmers'	Region 8 -	Farmers' Cooperative	1 Blending Machine	Imported from China through	CEST-DOST Region 8	Variety not yet identified	30-40 bags of 50kg/hr	Yes	Under negotiation	Funds available, Preparing

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
Producers Cooperative In partnership with LGU Loaong DOST-N. Samar 0998 192 5726 valaguitan@region8.dost.gov.ph	Loaong, Northern Samar			GTC Propack, Taguig City		Production not yet started				documents for bidding
3. Bagayas Rice Mill 0927-5275317 smalegado@region11.dost.gov.ph 087 3884 085 ord@region11.dost.gov.ph	Region 11 - Davao Oriental	Rice Mill and Rice Trader	1 Blending Machine	Mundo Engineering Works, Davao de Oro	DOST SET UP Region X1	Tonner	30-40 bags of 50kg/hr	Yes	Did not apply	Stopped due to low demand
4. Loronix Rice Mill 0920-4129151 gapslorn@gmail.com	Region 11 - Nabunturan, Davao de Oro	Rice Mill and Rice Trader	1 Blending Machine	Mundo Engineering Works, Davao de Oro	DOST SET UP Region-X1	Tonner	30-40 bags of 50kg/hr	Yes	Did not apply	Stopped due to low demand

Company	Site of Rice Mill/ Blending Facility	Classification	Blending Equipment	Fabricator	Assistance/ Source of Funds	Variety of Rice	Capacity/ hour	With Rice Mill	With License from FNRI	Status
5. National Food Authority (NFA) 455-5274	NCR - Visayas Ave., Diliman Quezon City	Government Agency for rice buffer stocking	Importation of 31 Big blending machines	Imported from Vietnam from Alheed	Gov't Funds	Various so called NFA Rice	5 tons/hr x 4 = 20 tons/hr.	Yes	Not applicable	Pilot testing of 4 blending machines

Annex 7. Location of NFA rice fortification blending facilities nationwide



Annex 8. DSM rice kernel for fortification

Assumptions:

Mixing ratio of premix to rice is 1:100 to produce fortified rice
 Conversion factor of cooked rice to milled rice is 0.417 (source FNRI)
 100 grams cooked rice = 41.7 grams fortified rice (approximately ½ cup cooked rice well packed)

200 grams cooked rice = 83.4 grams fortified rice (approximately 1 cup cooked rice well packed)
 Based on 2002 RENI Table
 Iron and Zinc RENI for pregnant women based on 2nd trimester

Fortificant	Amount in Premix/ 100 gms	Amount in 100 gms fortified rice raw	1 to 3 years old			4 to 6 years old			7 to 9 years old			Pregnant women		
			RENI	% RENI 100 gms cooked	% RENI 200 gms cooked	RE NI	% RENI 100 gms cooked	% RENI 200 gms cooked	RENI	% RENI 100 gms cooked	% RENI 200 gms cooked	RENI	% RENI 100 gms cooked	% RENI 200 gms cooked
Vitamin A	18,340 mcg	183 mcg	400	19.1	38.2	400	19.1	38.2	400	19.1	38.2	800	9.5	19
Vitamin B1	40 mg	0.4 mg	0.5	33.4	67	0.6	27.8	55.6	0.7	23.8	47.7	1.4	11.9	23.8
Vitamin B6	39 mg	0.39 mg	0.5	32.5	65	0.6	27.1	54.2	1.0	16.3	32.6	1.9	8.6	17.2
Vitamin B12	72 mg	0.72 mg	0.9	33.4	66.7	1.2	25	50	1.8	16.7	33.4	2.6	11.5	23.1
Niacin	480 mg	4.8 mg	6	33.4	66.8	7	28.6	57.2	9	22.2	44.4	18	11.1	22.1
Folic Acid	8,000 mcg	80 mcg	160	20.9	41.7	200	16.7	33.4	300	11.1	22.2	600	5.6	11.1
Iron	600 mg	6 mg	8	31.3	62.6	9	27.8	55.6	11	22.7	45.5	34	7.4	14.7
Zinc	192 mg	1.92 mg	4.5	17.8	35.6	5.4	14.8	29.6	5.4	14.8	29.6	6.6	12.1	24.2

Annex 9. Iron-fortified rice procurement by DepEd School Division Offices, 2021

Schools Division Offices (SDOs) with Procurement of Iron-Fortified Rice

Region	SDO	Contract Amount	Status
I	La Union	3,880,440.00	On-going delivery
I	Pangasinan I	52,861,326.00	On-going delivery
I	San Fernando City	445,680.00	On-going delivery
III	Malolos	688,704.00	On-going delivery
III	Aurora	7,196,475.00	On-going delivery
III	Bulacan	9,459,720.00	On-going delivery
III	Tarlac City	1,921,035.90	On-going delivery
III	Pampanga	5,501,503.91	On-going delivery
IV-A	San Pablo	2,063,520.00	On-going delivery
IV-A	Cavite Province	8,499,677.00	On-going delivery
IV-A	Binan City	1,779,300.00	On-going delivery
IV-A	Laguna	9,308,700.00	Done
VII	Carcar City	803,196.00	
NCR	Manila	4,525,400.00	On-going delivery
Total		85,640,857.81	

Annex 10. IFR requirement per region for DepEd SBFP (2022) and DSWD SFP (2015).

Assumption:

DepEd requirement per beneficiary is 350 grams/5 days or 8.4 kg IFR per beneficiary

DSWD requirement per beneficiary is 100 grams/day or 12 kg IFR per beneficiary

Region	DepEd Targets	IFR Needed (MT)	DSWD Targets	IFR Needed (MT)	Total IFR needed DepEd and DSWD (MT)
I – Ilocos	176,929	1,486.20	84,532	1014.384	2,500.59
II – Cagayan	108,483	911.26	91,712	1100.544	2,011.80
III – Central Luzon	334,448	2,809.36	128,073	1536.876	4,346.24
IV-A - Calabarzon	553,714	4,651.20	189,320	2271.84	6,923.04
IV-B - Mimaropa	147,971	1,242.96	78,479	941.748	2,184.70
V – Bicol	299,417	2,515.10	150,000	1800	4,315.10
VI – Western Visayas	277,003	2,326.83	193,922	2327.064	4,653.89
VII – Central Visayas	272,079	2,285.46	143,255	1719.06	4,004.52
VIII – Eastern Visayas	189,607	1,592.70	69,590	835.08	2,427.78
IX - Zamboanga	152,945	1,284.74	109,553	1314.636	2,599.37
X – Northern Mindanao	180,296	1,514.49	166,825	2001.9	3,516.39
XI – Davao	153,666	1,290.79	120,000	1440	2,730.79
XII - SOCCSKSRAGEN	171,142	1,437.59	99,121	1189.452	2,627.04
XIII - CARAGA	109,754	921.93	75,791	909.492	1,831.43
NCR	313,720	2,635.25	130,960	1571.52	4,206.77
CAR	40,857	343.20	45,045	540.54	883.74
BARMM	160,000	1,344	102,409	1228.908	2,572.91
Philippines - Grand Total	<u>3,642,031</u>	<u>30,593</u>	<u>1,978,587</u>	<u>23,743</u>	<u>54,336</u>



REGIONAL DEVELOPMENT COUNCIL – ILOCOS REGION

NEDA REGIONAL OFFICE I

EXCERPT FROM THE MINUTES OF THE 4th REGULAR RDC-1 FULL COUNCIL MEETING HELD ON 28 NOVEMBER 2019 AT PRESIDENT HOTEL, LINGAYEN, PANGASINAN

RDC-1 Resolution No. 104, s. 2019

ENCOURAGING ALL CONCERNED GOVERNMENT INSTRUMENTALITIES TO PATRONIZE AND PROMOTE THE USE OF "IRON FORTIFIED RICE" AS A COMPLEMENTARY STRATEGY TO ADDRESS THE IRON DEFICIENCY PROBLEM IN REGION 1

WHEREAS, Chapter 14 of the Ilocos Regional Development Plan (RDP) 2017-2022 aims to harness the contribution of Science, Technology and Innovation (STI) towards competitive and inclusive knowledge economy;

WHEREAS, the Regional Development Council 1 (RDC 1) recognizes the importance of science and technology to steer economic development, and the need to promote and adopt innovative projects and ideas that will help solve the multifarious problems of development;

WHEREAS, the Regional Research, Development and Innovation Committee 1 (RRDIC 1) as the research and innovation coordinating arm of the RDC 1 has established mechanism to bridge development challenges and gaps through the promotion and popularization of Filipino technological innovations which can possibly contribute to the resolution of development concerns of the region;

WHEREAS, the said process of the RRDIC was approved by the RDC 1 through RDC-1 Resolution No. 72, s. 2018, "Institutionalizing Mechanisms to Promote the Use of Products of Accredited Filipino Inventors and Science-Based Organizations" last November 29, 2018;

WHEREAS, the RRDIC assessed the "Iron Fortified Rice" Technology and found it worthy for promotion as it addresses the PDP and Ilocos RDP aim towards accelerating human development through achieving healthy population specifically in improving the iron status of the people in the region, thereby preventing diseases like anemia;

NOW THEREFORE, BE IT RESOLVED, AS IT IS HEREBY RESOLVED, to encourage all concerned government instrumentalities to patronize and promote the use of the "Iron Fortified Rice", as a complementary strategy to address the iron deficiency problem of populace;

RESOLVED FURTHER, that interested government agencies, local government units and government and private entities may coordinate with DOST Region 1 as the Chair of the RRDIC 1 in partnering with the Nutridense Food Manufacturing Corp., the adopter of the "Iron Fortified Rice" technology in Region 1;

RESOLVED FINALLY, to provide a copy of this resolution to all concerned entities for their appropriate action and request them to provide feedback to the RDC 1;

APPROVED, this 28th day of November 2019 at Lingayen, Pangasinan.

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REGIONAL DEVELOPMENT COUNCIL – ILOCOS REGION
NEDA REGIONAL OFFICE 1

CERTIFIED TRUE AND CORRECT:

DONALD JAMES GAW
RDC-1 Secretary
(NEDA RO1 Asst. Regional Director)

ATTESTED BY:

NESTOR G. RILLON
RDC-1 Vice-Chairperson
(NEDA RO1 Regional Director)

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Annex 12. Communications and strategic plan for rice fortification
(An output of a workshop held on 10-12 February 2016.)

Republic of the Philippines
Department of Health
National Nutrition Council

Table 12.1 Setting milestones/ targets, identifying key barriers, enablers, strategies, involved agency and timeline

Barrier	Enablers	Strategies	Involved agency	Timeline
FDA standards on fortification Specifications of fortificants Mixing process Ratio of fortificant	Existing technology on fortification	Convene a small group meeting to review and discuss the IFR as well as revisit the study conducted by NCP and review recommendations	FNRI, NFA, NNC, FDA, HCM, Rice Industry	February 11, 2016
Issues on the legalities of IFR (specific issues must be addressed)	Study on the Policy Review on Mandatory Fortification (NCP, 2012)	Technical working group of Food Fortification will write to FDA to address the issues on IFR with consultation from FNRI as they know the technology and strategy on fortification Revise and study RA 8976 and its IRR	NNC, HCM, FNRI, NFA, FDA, Rice Industry NNC as lead	End of February 2016
Perception on the quality of the product	Consumer demand for IFR as DSWD and DepEd need this for SFP	Conduct of advocacy meeting and dialogues to include NAPC and NFAC	NNC, NFA, DA	See output of Workshop 2
	An existing DSWD guidelines on feeding program	Discuss and arrange the proper mechanism on the procurement of fortificant between Disaster Group of DSWD and NFA	Disaster group of DSWD and Marketing group of NFA	On-going

Barrier	Enablers	Strategies	Involved agency	Timeline
	<p>DSWD Manual on SFP can buy IFR from private sector</p> <p>Existences of ordinances like Compostella Valley's</p> <p>RA 9184 "Government Procurement Reform Act" and Government Procurement Policy Board</p>	<p>Development of manual of SFP</p> <p>Disseminate Compostella Valley ordinance as model</p> <p>Download the guidelines on alternative mode of procurement on GPPB website and disseminate</p>	<p>DSWD PSD</p> <p>DOH and DILG</p> <p>NNC</p>	<p>On-going and provide update by March 2016</p> <p>During advocacy meetings</p> <p>February 19, 2016</p>
Lack of supply of fortificant (ferric pyrophosphate) and fortified kernels	<p>Existence of Supplier of fortificant</p> <p>Local technology transfer for fortified kernel available</p>	<p>Distributor to discuss with fortificant producer possible discount</p> <p>FNRI to conduct seminars to encourage millers and rice industry to produce fortified kernels</p>	<p>FNRI and VITACHEM</p> <p>FNRI and NFA</p>	<p>On going</p> <p>As needed</p>
Funds for Communication and Promotions	Existing media programs of NNC and other agencies	Text blasting, Radyo ng Bayan, Social Media, Segment buying Existing media programs of agencies needs evaluation on how well it directs message to the mass	PIA and NNC	ASAP
Proper/No Enforcement of the Law	Upcoming presidential election	Write to COMELEC malnutrition issues and	NNC	February 19, 2016

Barrier	Enablers	Strategies	Involved agency	Timeline
		SDG2 as topic in presidential debates MOA Review between NFA and FDA. Identify role of LGUs	FDA and NFA NNC with DILG and BLHD	Schedule with FDA For discussion

Table 12.2a Communications plan on rice fortification for rice industry

Target Group/Audience: Rice Industry (Millers, Farmers, Wholesalers, Middlemen, Retailers)						
<i>Expected behavior</i>	<i>Message</i>	<i>Channel to convey message</i>	<i>Frequency</i>	<i>Timeline</i>	<i>Responsibility</i>	<i>Evaluation to determine effectiveness</i>
Awareness of RA 8976 (ALL)	Benefits of mandatory rice fortification for anemia reduction that benefits whole family	NFA during renewal of license Provision of IEC materials (flyers and posters) Seminars pre-requisite for renewal BAEx	During renewal of license (give flyer) Seminars monthly	Yearly as needed	DA for farmers NFA (BAEx) LGU's as part of business permits NAPC/ NAFC	No. of licenses granted with IFR No. of agriculturists trained % attendees who gained knowledge based on evaluation form
To understand the need for premix and blenders to produce IFR (millers, wholesalers)	It is important to produce premix and mix properly the premix to rice to obtain correct level of iron	NFA during renewal of license Provision of IEC materials (flyers and posters) Seminars pre-requisite for renewal and connect millers to fabricators of blenders	During renewal of license (give flyer) Seminars monthly	Yearly as needed	NFA LGU's as part of business permits FNRI	% attendees who gained knowledge based on evaluation form % of attendees who purchased blending machines No. of millers producing premix and IFR
Retailers/dealers and traders to sell IFR	Benefits of IFR Inform suppliers of IFR	NFA during renewal of license	During renewal of	Yearly as needed	NFA	No. of retailers and traders selling IFR

Target Group/Audience: Rice Industry (Millers, Farmers, Wholesalers, Middlemen, Retailers)						
<i>Expected behavior</i>	<i>Message</i>	<i>Channel to convey message</i>	<i>Frequency</i>	<i>Timeline</i>	<i>Responsibility</i>	<i>Evaluation to determine effectiveness</i>
		Provision of IEC materials (flyers and posters) Seminars pre-requisite for renewal and connect them to suppliers of IFR	license (give flyer) Seminars monthly			
Industry associations (PHILCONGRAIN S, GRECON, Farmers groups)	To be convinced that they should be partners in advocating rice fortification	Advocacy meeting with NFA and DA	Quarterly	Start by 3 rd Quarter of 2016	NFA, DA	Industry associations advocating rice fortification to members No. of seminars organized by the association to members

Table 12.2b Communications plan on rice fortification for consumers, focused on social safety net programs

Target Group/Audience: Social Safety Net Program Participants and their Parents/Care-givers						
<i>Expected behavior</i>	<i>Message</i>	<i>Channel to convey message</i>	<i>Frequency</i>	<i>Timeline</i>	<i>Responsibility</i>	<i>Evaluation to determine effectiveness</i>
Increased knowledge on the advantage of using IFR vs non-fortified rice	Health benefits of IFR – controls anemia	PTA meetings-serve IFR during meetings School-based activities (Nutrition Month) Parent effectiveness sessions/ family development sessions(develop complementary	At least twice a year At least once a year At least one session per year	2016	DepEd-homeroom teachers DSWD-parent leader, municipal link, Day care workers	Pre- and post- interview (develop survey form) Indicator: % increased of parents of the participants who increased their knowledge on IFR

Target Group/Audience: Social Safety Net Program Participants and their Parents/Care-givers						
<i>Expected behavior</i>	<i>Message</i>	<i>Channel to convey message</i>	<i>Frequency</i>	<i>Timeline</i>	<i>Responsibility</i>	<i>Evaluation to determine effectiveness</i>
		<p>material on IFR to be included in the module)</p> <p>Existing media programs of NNC and other government agencies</p> <p>Convene international and national NGOs involved in feeding programs</p>			<p>NNC, PIA</p> <p>NNC, DOH, DSWD, DILG, ULAP, DepEd</p>	<p>Proportion of NGOs who attended the forum who bought IFR for their SSNP</p>
NGOs to buy IFR for their SSNP	New technology produces colorless, tasteless and odorless IFR					

Table 12.2c Communications plan on rice fortification for government, including LGUs

Target Group/Audience: Government/LGUs						
<i>Expected behavior</i>	<i>Message</i>	<i>Channel to convey message</i>	<i>Frequency</i>	<i>Timeline</i>	<i>Responsibility</i>	<i>Evaluation to determine effectiveness</i>
<p>Commitment to enforce/implement the law</p> <p>Agencies to adhere/implement the law for safety net programs</p> <p>NFA – fortification/distribution</p> <p>Ensure budget allocation</p>	<p>Agencies to integrate activities re: implementation of the law</p> <p>Orientation (key messages to be delivered)</p> <p>Distribution of IFR for safety net programs</p> <p>Ensure procurement of IFR for government safety net programs</p> <p>to act on the pending revised standards for fortification document submitted</p>	<p>NNC to convene Governing Board (Secretaries)</p> <p>NNC- To also convene face meetings with Secretaries of DSWD, DOH, FDA, NFA, DOST</p>	Twice a Year	<p>April 2016</p> <p>February-March 2016</p>	<p>NNC Secretariat</p> <p>NNC + selected TWG members</p>	<p>% of SF programs utilizing IFRs</p> <p>% of IFR distributed during calamities</p> <p>Revised and published standards</p>

Target Group/Audience: Government/LGUs						
<i>Expected behavior</i>	<i>Message</i>	<i>Channel to convey message</i>	<i>Frequency</i>	<i>Timeline</i>	<i>Responsibility</i>	<i>Evaluation to determine effectiveness</i>
Phase Implementation Licensing of rice millers	to reconvene the TWG for review and revision of the IRR	Tech Com and NNC Governing Board		March – December 2016	Small group to be convened by NNC Secretariat	% of industry compliance Kernel quality monitored
DSWD/DEPED/DOH – to utilize IFR for safety net programs with sufficient funds for procurement FDA-DOH – to ensure approval and enforcement of standards, to conduct monitoring and review (re-issuance of circular on hospitals to use IFR/ use of IFR on undernourished High school students)	Government agencies to provide fund for the relaunch Government canteens to serve IFR Rice subsidy of local gov't employees should be IFR					Presented to Techcom and Approved by NNC Governing Board Full implementation of the law by responsible agencies
NNC- Review and revise IRR and if needed, all existing policies on rice fortification.						
Nationwide Relaunching of IFR with full media blast		Through NNC		July	NNC	
LGU to develop local ordinance						



Do You Know that...

IRON DEFICIENCY ANEMIA IS STILL PREVALENT IN THE PHILIPPINES?



- Iron deficiency anemia (IDA) or anemia affects 30% of the world's population, making it the most common nutritional deficiency.
- In developing countries like the Philippines, the most common cause of anemia is **insufficient intake of iron-rich food in the diet.**
- **Anemia was the most important contributing factor to the global burden of disease,** according to the World Health Organization in 2002.
- **Anemia mostly affects 4 out of 10 infants ages 6 to 11 months** in the Philippines and is still considered as **"severe"** public health problem, according to the Food and Nutrition Research Institute's 2013 National Nutrition Survey (FNRI NNS, 2013).
- **1 in 10 school-aged children has anemia,** which adversely effects their cognitive performance, behavior, and physical growth (FNRI NNS, 2013).
- Pregnant and lactating women are at-risk, with 1 out of 4 pregnant women and 2 out of 10 lactating mothers with anemia (FNRI NNS, 2013).
- Anemia during pregnancy increases health risks for mothers and newborns, as well as increases risk of haemorrhage, sepsis, maternal mortality, perinatal mortality and low birth weight (WHO, Iron Deficiency Anaemia Assessment, Prevention, and Control - A guide for programme managers, 2001).
- Anemia leads to poor physical performance, decreased productivity, weight loss, weak resistance and immunity to sickness, anemic babies born by anemic mothers and even death in serious cases.
- Lack of iron in the blood is largely due to lack of consumption of iron-rich foods like liver, meat, chicken blood, fish, shellfish, eggs, beans, nuts, dried fruits, dark green leafy vegetables, seaweeds and iron-fortified products.
- Iron-Fortified Rice (IFR) is an ideal source of iron for Filipinos since we eat rice three times a day on the average.
- IFR developed by the FNRI of the Department of Science and Technology (DOST) is now increasingly made available commercially by technology adaptors nationwide.

Buy and eat Iron-Fortified Rice and see your productivity rise!



For more information on Iron-Fortified Rice, contact:
Dr. Mario V. Capanzana, DOST-FNRI Director at 837-2934, mar_v_c@yahoo.com, mvc@fnri.dost.gov.ph
or visit your DOST regional or provincial office.
Visit our website at www.fnri.dost.gov.ph and like
our Facebook page: Development, production and dissemination made possible through the collaboration among DOST-FNRI, DOST regional and provincial offices, Nutrition International, National Nutrition Council, FNRI IFR adaptors and LGUs concerned.



Do You Know that...

ANEMIA POSES HEALTH RISKS AND DECREASES PRODUCTIVITY?



- Iron is an important micronutrient responsible for many body processes, like bringing oxygen to all part of the body, production of genetic material, healthy nerves, energy absorption and cell development.

- There is an increased demand for iron by our body especially during the rapid growth stage among children, adolescents, pregnant women and breastfeeding mothers.

- Lack of iron in the blood or iron deficiency anemia (IDA) is largely due to the lack of consumption of iron-rich foods like liver, meat, chicken blood, fish, shellfish, eggs, beans, nuts, dried fruits, dark green leafy vegetables, seaweeds and iron-fortified products.

-IDA leads to poor physical performance, decreased productivity, weight loss and weak immune system leading to infection.

-In serious cases, anemic babies born to anemic mothers are more at-risk of death.

-Iron-Fortified Rice (IFR) is an ideal source of iron since we eat rice three times a day on the average.

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Do You Know that...

ANEMIA POSES HEALTH RISKS AND DECREASES PRODUCTIVITY?



- Children with anemia have poor physical, mental and overall school performance.
- The effects of anemia are serious in the first 1,000 days of life or the period from a child's conception to two years of age.
- This critical window of opportunity determines an individual's future, physical and mental health, emphasizing the importance of addressing anemia in infants and children.
- For all age groups, anemia can decrease immunity from infections and other diseases.
- Pregnant women with anemia have increased risk for complications in pregnancy, like premature birth and abnormal growth of the baby in the womb.
- Lack of iron in the blood or iron deficiency anemia (IDA) is largely due to the lack of consumption of iron-rich foods like liver, meat, chicken blood, fish, shellfish, eggs, beans, nuts, dried fruits, dark green leafy vegetables, seaweeds and iron-fortified products.
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Do You Know that...

IRON DEFICIENCY ANEMIA CAN BE PREVENTED?



- Consumption of iron-rich food is the most desirable and sustainable methods of preventing anemia.

- Strategies in preventing anemia should improve availability of and access to iron-rich foods, especially among at-risk groups.

- Campaign for addressing anemia must be sustained to influence feeding practices towards consumption of iron-rich foods.

- Consume foods that increase iron absorption like meat, poultry, fish, and seafood, plus those high in vitamin C like citrus fruits, juices, tubers, green leafy vegetables, cauliflower and cabbage, among many others to increase iron absorption in foods.

- Plan meals carefully. Avoid food that reduces iron absorption like cereal bran, flour from whole grains, legumes, nuts, and seeds, plus those with high inositol content like energy drinks as well as those high in tannins like tea, coffee, cocoa and herbal infusions.

- Iron-Fortified Rice (IFR) is an ideal source of iron since we eat rice three times a day on the average.

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Do You Know that...

IRON FORTIFICATION OF RICE IS MANDATORY?



- Fortification is the process of increasing the nutritional value of food by adding vitamins and minerals to prevent nutritional deficiencies and provide a health benefit with minimal risk.

- Iron fortification in staple foods, such as rice, has been found as an effective long-term approach to improving the iron status of populations.

- Compliance aspects indicate that iron fortification is better than supplementation.

- In the Philippines, Republic Act 8976, also known as the "Philippine Food Fortification Act of 2000", is the legal basis for the mandatory food fortification of rice with iron.

- Iron-Fortified Rice (IFR) is an ideal source of iron since we eat rice three times a day on the average.

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Do You Know that...

SUCCESSFUL PARTNERSHIPS FOR IRON-FORTIFIED RICE EXIST?



- The National Nutrition Council (NNC) coordinates programs to scale-up rice fortification in the Philippines.

- "Moving Forward Towards Mandatory Rice Fortification in the Philippines" is a collaboration with the United Nations Children's Fund (UNICEF) and Food Fortification Initiative.

-The collaboration brings Iron-Fortified Rice to school children through the Department of Education's (DepEd) school-based feeding program (SBFP) for malnourished kindergarten to Grade 6 pupils and the Department of Social Welfare and Development's (DSWD) supplementary feeding program for children 2-5 years old in daycare centers.

-The Department of Science and Technology's Food and Nutrition Research Institute conducted a project on "Scaling-Up Rice Fortification Program through Technology Transfer: A Strategy towards Nutrition Security" in Regions XI and XII.

- This model that includes the implementation of an ordinance in support of rice fortification is now implemented at Compostela Valley province and strives to go nationwide for its campaign on IFR and prime-up production through partnerships.

- In 2017, the Nutrition International (NI) offered its technical assistance for scaling up rice fortification for Social Safety Net Programs (SSNP)

- Iron-Fortified Rice (IFR) is an ideal source of iron since we eat rice three times a day on the average.

-IFR was developed by the Food and Nutrition Research Institute (FNRI) of the Department of Science and Technology (DOST) and is now increasingly made available commercially

Buy and eat Iron-Fortified Rice and see your productivity rise!



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Visit our website at www.fnri.dost.gov.ph and like our Facebook page: Development, production and dissemination made possible through the collaboration among DOST-FNRI, DOST regional and provincial offices, Nutrition International, National Nutrition Council, FNRI IFR adaptors and LGUs concerned.



Do You Know that...

COMPOSTELLA VALLEY IS A MODEL OF PARTNERSHIP FOR IRON-FORTIFIED RICE PROGRAM?



- **Compostella Valley (ComVal) is implementing a model of the Department of Science and Technology's Food and Nutrition Research Institute (DOST-FNRI) for a feeding program using iron-fortified rice (IFR), in cooperation with Gawad Kalinga's Kusina ng Kalinga.**

- The ComVal Provincial Ordinance mandates use of IFR in Social Safety Net Program(SSNP) and Food Service Establishments **to strengthen the campaign for iron-fortified rice.**

- The Department of Science and Technology's Food and Nutrition Research Institute of the (DOST-FNRI) and DOST Region XI were conferred with the 2017 Civil Service Commission (CSC) Pagasa Award for the effective implementation of rice fortification in Compostella Valley.

- This DOST-FNRI project also garnered the Alberto Romualdez Outstanding Health Research Award (AROHRA) given by the DOST's Philippine Council for Health Research and Development in August 2017.

- **Iron-Fortified Rice (IFR) is an ideal source of iron since we eat rice three times a day on the average.**

- **IFR was developed by the DOST-FNRI and is now increasingly made available commercially by technology adoptors nationwide.**

Buy and eat Iron-Fortified Rice and see your productivity rise!



For more information on Iron-Fortified Rice, contact: **Dr. Mario V. Capanzana**, DOST-FNRI Director at 837-2934, mar_v_c@yahoo.com, mvc@fnri.dost.gov.ph or visit your DOST regional or provincial office.

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Do You Know that...

LOCAL GOVERNMENT UNITS ARE KEY TO ANEMIA PREVENTION THROUGH IRON-FORTIFIED RICE (IFR)?



- **Iron-Fortified Rice (IFR) has been proven to help address anemia.**

- IFR is produced by mixing iron rice premix with ordinary rice to produce IFR that provides 50% of our daily requirement for iron if we consume 4 to 5 cups of IFR daily.

- Anemia is due to the lack of iron in the blood.

- Anemia leads to poor physical performance, decreased productivity, weight loss and weak resistance and immunity to sickness.

- In serious cases, anemic babies born by anemic mothers are at greater risk of dying.

- Lack of iron in the blood is largely **due to lack of consumption of iron-rich foods like liver, meat, chicken blood, fish, shellfish, eggs, beans, nuts, dried fruits, dark green leafy vegetables, seaweeds and iron-fortified products.**

- Iron-Fortified Rice (IFR) is an ideal source of iron since we eat rice three times a day on the average.

- A model partnership among DOST-FNRI, DOST Compostella Valley provincial office, Nutrition International, Gawad Kalinga, Saavedra Rice Mill of Moncayo and the concerned local government units of Compostella Valley has been successful in addressing anemia by feeding school children with IFR.

- Local government units with high prevalence of anemia can avail of the IFR technology from DOST-FNRI by coordinating with DOST regional and provincial offices to facilitate similar partnership.

Adopt Iron-Fortified Rice and see your productivity rise!



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Do You Know that...

ENTREPRENEURS CAN HELP FIGHT ANEMIA BY SUPPORTING RICE FORTIFICATION



Anemia remains to be a persistent National health problem with 1 in 10 (11.2%) Filipinos suffering from it.

- IFR is ordinary rice mixed with an iron fortificant that provides 50% of our daily requirement for iron if we consume 4 to 5 cups of IFR daily.

-NFMC is the technology adoptor of IFR developed by the Department of Science and Technology's Food and Nutrition Research Institute.

-NFMC sells IFR under the brand NUTRIDENSE Rice for Php 45.00 per kilo.

- The added cost of fortifying rice with iron to combat anemia is just **Php 2.00 per kilo.**

- The estimated capital needed to produce the premix to fortify rice with iron is around Php 5 million, depending on the planned scale of production.

- NFMC delivers nationwide through various shipment methods.

-DOST-FNRI developed IFR to help address anemia that still significantly affects infants, pregnant and lactating women and the elderly.

-Anemia is due to the lack of iron in the blood.

-Anemia leads to poor physical performance, decreased productivity, weight loss, weak resistance and immunity to sickness, anemic babies born by anemic mothers and even death in serious cases.

- Local government units with high prevalence of anemia can avail of the IFR technology from DOST-FNRI by coordinating with DOST regional and provincial offices to facilitate partnerships with rice millers, local government units (LGUs) and NGOs.

Adopt Iron-Fortified Rice and see your productivity rise!



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Visit our website at www.fnri.dost.gov.ph and like our Facebook page
Also contact **Mr. Rocky Doctor**, **NUTRIDENSE President**, at Malanay, Santa Barbara, Pangasinan through
Telefax: (075) 600 8251; Manila Office at UP-ISSI, Virata Hall, UP Diliman, Quezon City;

Mobile: 0999-729-0234, 0916-641-8611, 0923-703-2193; Email: nutridensefmc@yahoo.com.ph.

Development, production and dissemination made possible through the collaboration among DOST-FNRI, DOST regional and provincial offices Nutrition International, National Nutrition Council and the Provincial Health and Nutrition Offices of Pangasinan.

D La Union Province recently enacted an ordinance on rice fortification.

E In Urdaneta City, Pangasinan, all public elementary schools are providing iron- fortified rice in the school-based feeding program for Kindergarten to Grade 6.

F Compostela Valley (ComVal) Province enacted an ordinance for rice fortification in 2015. In 2016, a pilot study on a central kitchen model for school feeding with Gawad Kalinga (GK) and DepEd resulted in the significant decrease in anemia and malnutrition (93.4% increase to normal status). The implementation of the ordinance and Central Kitchen Model resulted in ComVal together with FNRI, DOST ComVal and Region XI being given the 2017 PAGASA Award of the Civil Service Commission conferred by President Rodrigo Duterte and the 2017 Benita Catalino Yap Foundation Award for Innovations on local governance for ComVal LGU.

13 **What are the on-going activities and plans in Compostela Valley to ensure the provision of iron-fortified rice to Comvalenos?**

There are now 14 Central Kitchens in all its 11 municipalities feeding 9,889 malnourished schoolchildren with IFR. It has generated funds through an Ending Hunger Summit that expanded its feeding program to about 3,000 individuals in geographically isolated areas. It also plans to buy IRP for production and distribution of IFR by NFA through a MOA and for millers and retailers to produce and sell IFR.

14 **How was the partnership between ComVal and Gawad Kalinga established?**

When Typhoon Pablo devastated Compostela Valley, Gawad Kalinga partnered with the Local Government to build houses through volunteerism. This started a series of activities through a partnership on Education and addressing Hunger through the Kusina ng Kalinga Program.

15 **How can we avail of technical assistance from National Agencies to provide iron-fortified rice for my constituents?**



DOST-FNRI provides technical assistance for the production of IRP and IFR for millers and investors. Presently, FNRI has transferred the technology to four IRP producers and six IFR producers. The Regional and Provincial Offices of DOST promote the said technology and conduct advocacy activities while the National Nutrition Council through their Nutrition Action Officers provide assistance in the development of local ordinances and their implementation. The Department of Social Welfare and Development and DepEd provide funding for feeding of pre-school and schoolchildren.

Frequently Asked Questions



TOGETHER,
WE RISE FOR
FORTIFIED RICE

Developed by: 

In Collaboration with:  

1 What is Republic Act 8976?

Republic Act 8976 or the Food Fortification Law of 2000 mandates the fortification of rice with iron, wheat flour with vitamin A and iron, cooking oil with vitamin A and refined sugar with vitamin A.

2 Why do we need to mandate the fortification of staple foods?

The fortification of staple foods with micronutrients is an effective strategy to control micronutrient malnutrition. Iron deficiency anemia (IDA) is the most prevalent form of micronutrient malnutrition.

3 What are the consequences of micronutrient malnutrition?

Micronutrient malnutrition leads to increased death rates, sickness due to decreased immunity to infection, slow physical and mental development resulting in slow learning and low school performance, blindness and less productive population among others.

4 Why is anemia the most prevalent form of micronutrient malnutrition among Filipinos?

Prior to the enactment of the fortification law in 2000, 3 out of 10 (30.6%) Filipinos are anemic, affecting mostly infants, pre-school children, women of reproductive age, pregnant and lactating women based on the 1998 nutrition survey of the Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI). IDA is **due to lack of intake of iron-rich foods and vitamin C foods and increased intake of iron inhibitors such as phytates in rice**. Vitamin C enhances iron absorption. These negative consequences need to be addressed immediately.

5 Is food fortification an effective strategy to control anemia?

Iron fortification of staple foods is a major contributor in controlling IDA, in combination with other strategies such as deworming, provision of iron tablets for pregnant women and nutrition education. These strategies significantly decrease anemia prevalence currently at 1 out of 10 based on the 2013 nutrition survey of the DOST-FNRI. This prevalence is still of public health significance that needs to be addressed.

6 Why is rice included in the mandatory iron fortification?

Rice is the most widely-consumed staple food by Filipinos. Frequent

consumption of iron-fortified rice may address

7 How is iron-fortified rice produced?

Iron-fortified rice is made by first producing iron rice premix using extrusion process. The iron-rice premix has similar shape and appearance of ordinary rice containing high concentration of iron. The iron rice premix is blended with ordinary rice at 1:200 ratio to produce iron-fortified rice.

8 How do we cook and consume iron-fortified rice?

Iron fortified rice is washed, cooked and consumed like ordinary rice.

9 How much iron can iron-fortified rice provide?

A day's intake of **4-6 cups** of cooked iron-fortified rice provides more than 50% of iron requirement of the body.

10 How much is the additional cost to produce iron fortified rice?

An estimated **2.00 pesos** is added to the cost of ordinary rice to produce IFR.

11 Where can we buy iron fortified rice?

Producers of iron rice premix and iron fortified rice that can supply nationwide and are PhilGEPS registered are as follows:

- **Nutridense Food Manufacturing Corporation, Pangasinan**, (0917-6878611 and 0923-7032198)
- **Antofel Trading, Compostela Valley**, (0920-9065332)
- **AIHeed Corporation**, (uses imported coated or extruded iron rice premix), Pasig City (0917-7350028)
- **Nutrition and Beyond Corporation, Nueva Ecija**, (0917-6201887 and 0905-2973539) and Quezon City, (0917-8950467)

12 Are there local government units that have initiatives of providing iron-fortified rice to their constituents?

Yes, examples of which are as follows:

- A** Davao City Mayor and now President Rodrigo R. Duterte in 2007 signed an Executive Order requiring food service establishments (Jollibee, McDonalds, Chowking etc.) to serve IFR and established a task force for monitoring. Establishments serving iron fortified rice were provided with a tarpaulin certificate indicating that they are serving IFR signed by then Mayor Duterte.

Infobits

Anemia in the Philippines

Anemia remains to be a persistent National health problem with 1 in 10 (11.2%) Filipinos suffering from it.

According to the 8th National Nutrition Survey of the Department of Science and Technology's Food and Nutrition Research Institute, (DOST-FNRI),

1 out of 4 Filipino pregnant women and 4 out of 10 infants have Iron Deficiency Anemia (IDA), majority of whom belong to the poor sector.

Iron Deficiency Anemia can be due to insufficient iron in the diet, blood loss and increased iron requirement during pregnancy and growth.

An anemic individual may experience decreased work in school performance, decreased immunity, and slow cognitive development among others.

If anemia remains untreated it can cause serious complications, such as heart and lung problems, premature birth, low birthweight and even infant death.

Anemia would also affect the country with increased morbidity and decreased productivity, Gross domestic product (GDP) loss of 4.05% and 2.5% decrease in income.

Let us consume more iron-rich foods or iron fortified products to combat anemia!



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Infobits

Iron Fortified Rice on the Rise

In response to the pressing problem of anemia in the Philippines and the mandatory food fortification of staple food under the Republic Act (RA) 8976, the Department of Science and Technology-Food and Nutrition Research Institute (DOST FNRI) developed: **Iron Fortification Rice (IFR) technology to help address Iron Deficiency Anemia (IDA) in the Country.**

Iron-Fortified Rice is enriched rice produced by mixing ordinary rice and Iron Rice Premix (IRP) a grain-like kernel made from a blend of rice flour and iron using hot extrusion technology.

The efficacy study conducted by FNRI in an elementary school in Pasig City, the community pilot market trial in Orion, Bataan and the trial in Zambales provided evidences for the high acceptability and effectiveness of IFR in decreasing the prevalence of anemia among school children.

Recognizing this, local government units who are mandated by RA 7160 (Local Government Code of 1991) to promote health, may respond to the public health problem of anemia by ensuring the supply of iron-fortified rice.

This can be done with strong political support by enactment and implementation of ordinances as in Compostela Valley and La Union experiences, cooperation and commitment with the partners like **Gawad Kalinga, Department of Science and Technology (DOST), Department of Education (DepEd), Department of Social Welfare and Developments, Department of Health (DOH)** and among others.

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Infobits

Implementation of Iron Fortified Rice (IFR) Ordinance

Compostela Valley and La Union have ordinances on the use of Iron-Fortified Rice (IFR) to significantly reduce the number of anemic individuals in their respective provinces.

Compostela Valley has Provincial Ordinance No. 29-2015, an ordinance providing mechanisms for the production and use of IFR in the province of Compostela Valley, otherwise known as **COMVAL i-Rice Ordinance of 2015**.

COMVAL i-Rice is now available in **Monkayo and Nabunturan, Compostela Valley**. The primary beneficiaries are 9, 889 public school elementary students through **Gawad Kalinga's Kusina ng Kalinga**.

La Union is Provincial Ordinance No. 118 series of 2017 or the Iron Fortified Rice Ordinance that mandates all local government units (LGUs), National Government Agencies, and other government agencies to use **La Union IFR in feeding programs, disaster relief operations, daycare centers, government hospitals, rehabilitation centers, local government unit canteens, school canteens and other food establishments serving rice**.

La Union and COMVAL's on going IFR ordinances serve as a model from which other LGUs can pattern their similar programs.

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Infobits

Partnership key to success of Iron Fortification Rice

Success of the mandatory food fortification law or Republic Act (RA) 8976 strongly relies on the political will of local chief executives and the partnerships they can establish with supportive agencies and institutions.

Compostela Valley (ComVal) has been using **Iron-fortified Rice (IFR)**, one of the technologies developed by the Department of Science and Technology's Food and Nutrition Research Institute (DOST-FNRI).

The IFR is being used for school-based feeding program of the Department of Education (DepEd) schools through the Gawad Kalinga's (GK) Kusina ng Kalinga central kitchen. Together with DepEd and GK, ComVal established 14 central kitchens throughout the province to feed **9,889 malnourished school-children**. Success of the program paved the way for bagging prestigious awards like the Civil Service Commission (CSC) Pagasa Award, Alberto Romualdez Outstanding Health Research Award (AROHRA), and Benita & Catalino Yap Foundation Innovation Award.

The victory and partnership between ComVal, DepEd, GK, DOST-FNRI, DOST-XI and DOST-ComVal serve as an example of bayanihan towards healthier and more productive citizens of the country.

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Infobits

Healthier Rice now within reach

The **two peso per kilo** difference between regular commercial rice and Iron-Fortified Rice (IFR) can go as far as preventing Iron Deficiency (IDA) in the Philippines.

Iron-fortified Rice is now locally available through suppliers who adopted the technology of the Department of Science and Technology Food and Nutrition Research Institute (DOST-FNRI) and have been distributing IFR to several areas in the country.

Nutridense Food Manufacturing Corporation, Nutrition and Beyond Corporation, Alheed International Trading Corporation, and CLG Health Food Products Incorporated are among the suppliers that distribute IFR nationwide. Antofel Trading supplies IFR in Compostela Valley, Agusan del Sur and Davao City.

Through these IFR technology adoptors, IFR is now within reach of Filipinos for healthier, livelier and more productive Philippines.

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Iron Fortified Rice (IFR) Helps to Fight Anemia!

Iron Fortified Rice is an enriched rice made by blending..



Iron Fortified Rice helps to fight anemia. In the Philippines, Anemia affects:



What is Iron Deficiency Anemia?

Anemia is caused by iron deficiency resulting in low red blood cells that causes:



A day's intake of 4 - 6 cups of IFR will meet more than 50% of the daily iron requirement of the body.

50%

Iron Fortified Rice is just an ordinary rice that be washed!



For more information on Iron-Fortified Rice, contact Dr. Mario V. Capasana, DOST-FNRI Director at 837-2954, mar_v_c@yahoo.com, mvc@fnri.dost.gov.ph or visit your DOST regional or provincial office. Visit our website at www.fnri.dost.gov.ph and like our facebook page: Development, production and dissemination made possible through the collaboration among DOST-FNRI, DOST regional and provincial offices, Nutrition International, National Nutrition Council, FNRI IFR adaptors and LGUs concerned.