

**FRUITS AND VEGETABLE FOR HEALTH:
The Health and Nutrition Situation of the Philippines***

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FNRI Mandate

The Food and Nutrition Research Institute of the Department of Science and Technology is the government's principal research arm in food and nutrition. It is mandated to define the citizenry's nutrition status, develop recommendations for the improvement of nutrition status, and disseminate research findings and recommendations.

The National Nutrition Survey

To fulfill its first mandate, the FNRI conducts the periodic National Nutrition Survey (NNS) every five (5) years. It has six (6) components, namely: a) Anthropometric Nutrition Survey; b) Household Food Consumption; c) Awareness and Usage of Fortified Foods and Fortifiable Foods; d) Biochemical Nutrition Survey; e) Clinical Phase for the National Nutrition and Health Survey (NNHeS); and Dietary Assessment among 0-5 year-old children, pregnant and lactating mothers.

Trends in the nutritional status based on the anthropometric survey

Generally, there are decreasing prevalence rates of underweight, stunting and wasting, while there is an increasing prevalence rates of overweight from 1989-1990 to 2003 among 0-5 years old children.

Among 6-10 year-old children, trends show that from 1989-1990 to 1996, there are decreasing prevalence rates of underweight and stunting. However, from 1996 to 2001, the trend is increasing but rates drop in 2003. On the other hand, the trend of overweight is generally increasing from 1990 to 2003.

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Using the National Statistics Office (NSO) 2003 projected population data, the estimated number of 0-5 and 6-10 year-old children who are underweight, underheight and thin are as follows:

Nutritional status	Prevalence Rate (%)	Estimated No. (in million)*
0-5 years old		
Underweight	26.9	3.1
Underheight	29.9	3.4
Thinness	5.3	0.6
Overweight	1.4	0.1
6-10 years old		
Underweight	25.6	2.4
Underheight	35.8	3.3
Overweight	1.3	0.1

*NSO 2003 Projected Population based on 1995 Census

Among adolescents, the prevalence of underweight rose from 1993 to 1998 and then decreased in 2003 for both males and females. The prevalence of overweight among males decreased from 2.6% to 1.2% in 1993 and 1998, respectively, and rose to 3.4% in 2003. In contrast, the prevalence of overweight among females increased from 2.2% to 4.7% in 1993 and 1998, respectively and dropped to 3.8% in 2003.

Lastly, among adults, the trend shows a constant increase in the prevalence of overweight and a constant decrease in the prevalence of chronic energy deficiency (CED) from 1993 to 2003. The prevalence is based on the WHO cut-off which is a body mass index (BMI) ≥ 25 for overweight and obese, and $BMI \leq 18.5$ for CED.

Trends in Iron Deficiency Anemia (IDA), Vitamin A Deficiency (VAD) and Iodine Deficiency Disorders (IDD)

IDA remains to be a public health concern among children 6 months to 1 year old, pregnant and lactating women with prevalence of 65.9%, 43.9%, and 42.2% respectively in 2003.

For VAD, prevalence rate is still of public health significance among 6 months to 5 year old children with 40.1%, pregnant women with 17.5 %, and lactating women with 20.1%, based on plasma retinol <20 micrograms/liter (deficient and low levels).

In 2003, IDD is no longer a public health concern among children 6-12 years old and pregnant women. Prevalence rate among lactating women, however, is 23.7% prevalence and still a public health concern.

Trends in Household Food Consumption

Based on the Food Consumption Survey Component of the 2003 NNS, the common diet of Filipino households at the national level is composed mainly of rice, fish and vegetables. Rice and cereals comprise almost half of the total one-day per capita food intake, followed by fish, vegetables, and meat and poultry. Fruits and vegetables, milk and milk products, and sugars, on the other hand, are lagging behind.

Consumption of energy-giving foods (e.g. rice and products, cereals and cereal products, starchy roots and tubers, sugar and syrups and fats and oils) show an increase from 1993 to 2003. This trend is also the same for body-building foods like milk and milk products, dried beans, nuts and seeds, eggs, fish and products, meat and products and poultry. In contrast, there is a declining consumption of fruits and vegetables. There was a slight increase from 106 to 110 grams in the consumption of vegetables from 1993 to 2003. However, this is still far behind the consumption in 1978. For the consumption of fruits, there has been a marked decrease from 1987 to 2003 from 107 grams to 54 grams.

Findings of the 2003 NNS show that the first 30 commonly consumed food items in the Philippines include:

Food Group/ Sup-group	Frequency	% Households Consuming
1. Rice, ordinary	2818	92.6
2. Coconut oil	2093	68.8
3. Salt, course	2091	98.7
4. Coffee, instant	1653	54.3
5. Sugar, refined	1584	52.0
6. Garlic	1461	48.0
7. Vetsin	1437	47.2
8. Onion, bombay	1409	45.3
9. Soy sauce	1136	37.3
10. Chicken eggs	981	32.2
11. Sugar, brown	941	30.9
12. Milk, powdered	779	25.6
13. Tomatoes	759	24.9
14. Pork, liempo	716	23.5
15. Softdrinks	682	22.4

Food Group/ Sup-group	Frequency	% Households Consuming
16. Pandesal	646	21.2
17. Vinegar, coconut	632	20.8
18. Eggplant	601	19.7
19. Sitaw	595	19.5
20. Milo	544	17.9
21. Instant noodle	513	16.9
22. Luya	493	16.2
23. Squash fruit	458	15.0
24. Pan de monay	430	14.1
25. Malunggay	426	14.0
26. Iodized salt	415	13.6
27. Bangus	359	11.8
28. Sardines in tomato sauce	359	11.8
29. Coconut cream	358	11.8
30. Okra	344	11.3

In terms of the nutrient adequacy of the food that Filipinos consume, findings reveal that calcium, iron, riboflavin, and vitamin C register the lowest prevalence of adequacy. The actual food intake among Filipinos has increased in 2003 with an intake of 1905 kilocalories (kcal), showing an upward trend from the 1684 kcal in 1993.

The bulk of the diet of 6 months to 5 year-old children consists of milk and milk products, and cereals comprising more than half of the one-day food intake. Fish, meat, fruits, and vegetables follow these food groups.

The following are the first 30 commonly consumed food items of 6-month to 5-year old Filipino children ranked by % of children who consumed the food item:

Rank	Food Group/ Sup-group	% of Total Subjects	Mean Intake (Raw, as Purchased, in grams)
1	Rice (well-milled, white)	88.8	108
2	Coconut oil (<i>langis ng niyog</i>)	63.0	4
3	Sugar (white, refined)	37.2	9
4	Milk (powdered filled milk)	29.5	27
5	Sugar (brown)	25.9	10
6	Chicken egg	25.4	27
7	Pan de sal	20.0	29
8	Milo chocolate drink	19.0	7
9	Instant noodles	17.4	19
10	Galunggong	16.9	45
11	Coffee (instant, powder)	16.4	
12	Squash fruit	15.7	22
13	Stringbeans, green	15.7	25
14	Saba banana	14.7	89
15	Softdrinks	14.2	128
16	Pork belly, lean part	13.5	32
17	Rice gruel	13.1	
18	Pan de monay	12.5	35
19	Candy, hard	12.4	5
20	Coconut cream (<i>niyog, kakang gata</i>)	11.6	11
21	Dried mungbeans	11.4	10
22	Cracker, salted	11.1	14
23	Horseradish tree, leaves (<i>malunggay, dahon</i>)	11.0	15
24	Tilapia	9.7	62
25	Hotdog	9.6	24
26	Milkfish	9.6	39
27	Eggplant	9.5	19
28	Sardines in tomato sauce	9.5	14
29	Fruit juice drink, orange	9.1	119
30	Corn grits, white (<i>mais, durog, puti</i>)	8.4	73

Trends in Non-Communicable Diseases

The NNHeS was conducted to determine the prevalence of nutrition-related and lifestyle diseases and risk factors among Filipinos 20 year-old and above. In 2003, the prevalence of diabetes is 3 in every 100 adults, high blood cholesterol at 8 in every 100 adults, and hypertension at 22 in every 100 adults. Based on waist circumference, 18 in every 100 for adult females and 3 in every 100 for adult males are android obese. In addition, there seems to be a rise in the prevalence of dyslipidemia, hypertension, diabetes mellitus and impaired fasting blood sugar among adults which may be attributed to physical inactivity, low consumption of fruits and vegetables.

Policy Environment

The Medium-Term Philippine Plan of Action for Nutrition (MTPPAN) 2005-2010

The MTPPAN is the country's blue print of programs and projects for nutrition improvement. The plan is overseen by the National Nutrition Council (NNC) Governing Board, which includes the Department of Health (DOH), Department of Agriculture (DA), Department of Science and Technology (DOST), Department of Local Government (DILG), Department of Education (DepEd), Department of Labor and Employment (DOLE), Department of Social Welfare and Development (DSWD), Department of Budget Management (DBM), Department of Trade and Industry (DTI), National Economic Development Authority (NEDA), and non-government organizations and individuals namely, GMA Foundation, Inc., ABS-CBN Foundation, Inc., and Ms. Elisa C. Valdecantos.

The programs included in the MTPPAN are: home, school and community food production, food fortification, micronutrient supplementation, nutrition information, communication and education, food assistance, livelihood assistance, and nutrition in essential maternal and child health services. Specifically, the home, school and community food production, food fortification, and nutrition information, communication and education address the issues on fruits and vegetables consumption in the Philippines.

Suggested Food-Based Intervention

The FNRI has developed and continues to develop food products addressing the nutritional problems of the country. Supplementary/nutrient-rich foods are developed, particularly weaning foods, snack foods, foods for disaster or emergency, condiments, and nutritious soup blends.

Staple foods such as rice, sugar, flour and oil are fortified with micronutrients to improve dietary intake. Lastly, functional foods such as high fiber, low fat foods and low sugar foods are also developed to address nutrition-related lifestyle diseases like diabetes and cardiovascular diseases.

The following are the food products already developed by FNRI:

Protein-rich Foods	Micronutrient-rich Foods	Functional Food Products	Calamity/Disaster/ Combat Rations
<ul style="list-style-type: none"> ❖ Curls (Extruded) <ul style="list-style-type: none"> ▪ Rice Mongo ▪ Rice Soy ▪ Corn Soy ▪ Corn Mongo ❖ Crunchies/chips <ul style="list-style-type: none"> ▪ Rice Mongo ▪ Corn Mongo ▪ Squash ❖ Complementary Foods <ul style="list-style-type: none"> ▪ Instant Rice Mongo ▪ Instant Gabi Paayap ▪ Instant Rice Soy ▪ Instant Corn Mongo ▪ Instant Corn Soy ▪ Rice Mongo Sesame ▪ Banana Soybean ▪ Banana Peanut ▪ Camote Paayap ▪ Banana Paayap ▪ Germinated Rice and Mongo 	<ul style="list-style-type: none"> ❖ Fortified Bihon Noodles ❖ Noodles (Canton Style & In Cups) <ul style="list-style-type: none"> ▪ Squash ▪ Seaweed ▪ Saluyot ❖ Noodles with Squash (canton Style) ❖ Noodles with Saluyot (Canton Style) ❖ Squash Products ❖ Dehydrated Vegetables <ul style="list-style-type: none"> ▪ Carrots ▪ Sweet Pepper ▪ Celery ▪ Kangkong leaves ▪ Alugbati leaves ▪ Kamote leaves ▪ Petsay leaves ▪ Mushroom caps 	<ul style="list-style-type: none"> ❖ Carrot-Pineapple Juice ❖ Carrot-Mango Juice ❖ High-fiber Cookies ❖ Soybean Spread ❖ Fruit Juice Drinks ❖ Soybean Gel ❖ Vegetable Mixes 	<ul style="list-style-type: none"> ❖ Rice Crispy Bars ❖ Instant Cream Soups ❖ Compressed Food

Small and Medium-scale Enterprises (SMEs) have been recipients of FNRI's technology transfer program. Among them are, Farmtech, Dayapan Multipurpose Cooperative, Eagle Multipurpose Cooperative, Jojo's Noodle Center and Moonbake, Inc.

The FNRI has also developed Vegetable Recipe Manuals like:

1. Mga Piling Lutuing Gulay – a compilation of vegetable recipes as main dish, snackfoods, dessert, and appetizers.
2. Squash Recipes – a compilation of squash recipes as main dish, snackfoods, dessert and appetizers.

In conclusion, there has been a general improvement between 1998 and 2003 in the country's overall nutrition situation of various population groups. There is, however, an increasing trend in overweight among adults as well as children. Nutritional anemia remains to be a major health problem among children 6 months to less than a year, and pregnant and lactating women. The iodine status of the 6-12 year-old children, pregnant and lactating women has improved. There is also increasing prevalence of non-communicable diseases among adults. Lastly, there is a significant reduction of fruits and vegetables consumption and low physical activity that may be associated with the increasing prevalence of non-communicable diseases.

Considering these, the FNRI recommends the following:

- ❑ Strengthening the targets set for 2004 in the MTPPAN and the Millenium Development Goals (MDGs) set for 2015 to reduce Protein-Energy Malnutrition, Chronic Energy Deficiency, Nutritional Anemia as well as arrest the increasing trend of overweight and obesity;
- ❑ Strict enforcement and proper implementation of the Food Fortification Law;
- ❑ Strengthen R&D efforts particularly on fruits and vegetable production and processing;
- ❑ Intensification of home food production; and
- ❑ Coordinated nutrition education and information campaign.

For more information, you may contact the Food and Nutrition Research Institute, Department of Science and Technology, DOST Compound, Bicutan, Taguig City or visit the FNRI home page at <http://www.fnri.dost.gov.ph>