

Glossary

This glossary is based on the following sources:

Allen L, de Benoist B, Dary O et al, eds. Guidelines on food fortification with micronutrients. Geneva: World Health Organization | Food and Agriculture Organization of the United Nations, 2006.

UNICEF. Nutrition Glossary: A resource for communication. Division of Communication, 2012 [www.unicef.org/lac/Nutrition_Glossary_\(3\).pdf](http://www.unicef.org/lac/Nutrition_Glossary_(3).pdf) (accessed April 30, 2015).

Anemia

Characterized by reduction in hemoglobin concentrations or the size and color of red blood cells, which impairs the ability to supply oxygen to the body's tissues. Anemia is caused by inadequate intake and/or poor absorption or excessive losses of iron, folate, vitamin B₁₂ and other nutrients. It can also be caused by infectious diseases (inflammation) such as malaria, hookworm infestation and schistosomiasis, and by genetic variants of hemoglobin. Women and children are high-risk populations. Clinical signs include fatigue, pallor (paleness), breathlessness and headaches.

Bioavailability

Bioavailability refers to the proportion of a nutrient that is absorbed from the diet and utilized for normal body functions. The ease by which the body absorbs specific micronutrients is determined by its molecular form and the interaction between different specific micronutrients and other substances in the diet.

Biofortification

Practice of improving the nutrient content of plants before harvesting through breeding (e.g. new rice variety with higher iron content) and/or genetic engineering (e.g. Golden Rice). The key difference between biofortified rice and fortified rice is that rice fortification implies adding nutrients to rice post-harvesting, while biofortification aims to make more nutritious rice varieties available through breeding or GMO. While current biofortified rice cultivars contain higher levels of one micronutrient, fortified rice can contain a range of several micronutrients.

Blending

Mixing of milled, non-fortified rice with fortified kernels in ratios between 0.5% and 2% to produce fortified rice. Blending

can be done at a rice miller, warehouse, or other location where rice is centrally processed. Small-scale blending technology is also available.

Brown rice

Rice with only the hull removed. Bran layers and rice germ remain, giving the rice a brownish color. Brown rice is still a rich source of vitamins B₁, B₆, E and niacin, most of which are removed during polishing/milling.

Coating

Technology to make fortified kernels. Rice kernels are coated with a fortificant mix plus ingredients such as waxes and gums. The micronutrients are sprayed onto the rice grain's surface. The coated rice kernels are blended with non-fortified rice in a ratio between 0.5% and 2%.

Dusting

Technology to make fortified rice. Polished milled rice kernels are dusted with a fortificant mix in powder form. This technology is only used in the United States and does not allow for washing, pre-cooking or cooking in excess water, since this will wash out the micronutrients.

Effectiveness

Refers to the impact of an intervention in practice (real-life conditions). Compared to efficacy, the effectiveness of a fortification program will be limited by factors such as non-consumption or low consumption of the fortified food.

Efficacy

Refers to the capacity of an intervention such as fortification to achieve the desired impact under ideal circumstances. This usually refers to experimental, well-supervised and controlled intervention trials.

Essential micronutrient

Refers to any micronutrient (vitamin or mineral), which is needed for normal growth, development and function by the body in miniscule amounts throughout the life cycle. Micronutrients are normally consumed as part of a healthy and diverse diet. They either cannot be synthesized in adequate amounts by the body at all, or else cannot be synthesized in amounts adequate for good health. They thus must be obtained from a dietary source.

Estimated average requirements (EAR)

EAR is the average (median) daily nutrient intake level estimated to meet the needs of half the healthy individuals in a particular age and gender group.

Evaluation

Systematic assessment using criteria governed by a set of standards to help in decision-making. The primary purpose of evaluation, in addition to gaining insight into prior or existing interventions, is to enable reflection and assist in the identification of future change. For fortification programs, this means assessing the effectiveness and impact of the program on the targeted population, and to provide evidence that the program is achieving its nutritional goals.

Extrusion

Technology to make fortified kernels. Rice-shaped reconstituted kernels are produced by passing rice flour dough, containing a fortificant mix, through an extruder. The extruded kernels, which are made to resemble rice grains, are then blended into non-fortified rice in a ratio between 0.5% and 2%, similar to the coating technology. Extrusion allows for the use of broken rice kernels as an input, and may be carried out under hot, warm, or cold temperatures, which influences the appearance and performance of the final fortified kernel.

Fortificant

Selected essential micronutrient in a particular form to fortify selected food (e.g., rice, flour, salt).

Fortificant mix

Blend that contains several fortificants, also referred to as premix.

Fortification

Practice of deliberately increasing the content of essential micronutrient(s), i.e., vitamins and minerals, in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health. The essential micronutrients are added to make the food more nutritious post-harvesting.

Fortification of rice distributed through social safety nets

Targeted rice fortification can be achieved by fortifying rice distributed through social safety nets, such as school feeding programs, distributions to the poor or vulnerable groups, food for work programs, and food aid during emergency situations. As social safety nets in most cases target the most vulnerable population groups, fortifying rice distributed through social safety nets will reach the most vulnerable populations and has great potential to make a significant impact on public health.

Fortified kernels

Fortified rice-shaped kernels containing the fortificant mix (extrusion) or whole rice kernels coated with a fortificant mix (coating). Fortified kernels are blended with non-fortified rice in a ratio between 0.5% and 2% to produce fortified rice.

Fortified rice

Rice fortified with fortificant mix by dusting, or non-fortified rice combined with the fortified kernels in a 0.5%–2% ratio. Typically fortified kernels are blended with non-fortified rice in 1:100 (1%) ratio.

Mandatory fortification

Mandated and regulated fortification of specific food commodities by the government sector through legislation. This means that all foods to which the legislation refers should be fortified according to the prescribed specifications.

Micronutrient deficiencies

A form of malnutrition caused by an insufficient intake of vitamins and minerals (also known as micronutrients), which are essential for human health, growth, development and function; also referred to as micronutrient malnutrition or hidden hunger. Micronutrient deficiencies are one of the main causes of poor health and disability, and affect over two billion people worldwide.

Micronutrient deficiency diseases

When certain micronutrients are severely deficient owing to insufficient dietary intake, insufficient absorption and/or sub-optimal utilization of vitamins or minerals, specific clinical signs and symptoms may develop, e.g., night blindness and xerophthalmia for vitamin A deficiency or rickets for vitamin D deficiency.

Milled rice

Polished rice is the regular milled white rice. Hull, bran layer and germ have been removed, and so have most of the vitamins. See also brown rice and parboiled rice.

Monitoring

Observing and checking progress or quality of a program over a period of time. For fortification programs it refers to the continuous collection and review of information on program implementation activities for the purposes of identifying problems (such as non-compliance) and taking corrective actions so that the program fulfils its stated objectives.

Non-fortified rice

Milled rice without fortification.

Nutrient requirement

Refers to the lowest continuing intake level of a nutrient that will maintain a defined level of nutrition in an individual for a given criterion of nutritional adequacy.

Parboiled rice

Rice that has been partially boiled in the husk. The three basic steps of parboiling are soaking, steaming and drying. Parboiling makes rice easier to process by hand, boosts its nutritional profile and changes its texture. Parboiling drives water-soluble nutrients from the bran to endosperm, hence parboiled white rice contains roughly half the water-soluble vitamins from brown rice, and is more nutritious than regular milled rice.

Quality assurance (QA)

Refers to the implementation of planned and systematic activities necessary to ensure that products or services meet quality standards. The performance of quality assurance can be expressed numerically as the results of quality control exercises.

Quality control (QC)

Refers to the techniques and assessments used to document compliance of the product with established technical standards, through the use of objective and measurable indicators.

Recommended nutrient intake (RNI)

RNI is the daily intake that meets the nutrient requirements of almost all apparently healthy individuals in an age- and sex-specific population group.

Regulatory monitoring

Comprises both internal and external monitoring; regulatory monitoring at the retail level is also referred to as commercial monitoring. The primary aim of regulatory monitoring is to ensure that the fortified foods meet the nutrient, quality and safety standards set prior to program implementation. Once regulatory monitoring has demonstrated that the program is operating in a satisfactory manner, evaluation of the program can be undertaken to assess its impact.

Tolerable upper intake level (UL)

Highest average daily nutrient intake level that is considered to pose no risk of adverse health effects to almost all (97.5%) apparently healthy individuals in an age- and sex-specific population group. The UL applies to daily use for a prolonged period of time for healthy individuals with no deficits to be corrected.

Voluntary fortification

A market-driven approach, with the fortified food product marketed as a “value-added” for the consumer. This approach relies on consumer awareness and education, demand, and willingness and ability to pay slightly more for the fortified product.