

Potential Benefits of Golden Rice Would Be Greatest for the Poorest



By Ruth Kava — September 21, 2016



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One of the potentially most valuable products of genetic engineering — public health-wise — was Golden Rice. This is rice which has genes added to it which allow the plant to make beta-carotene in its grain. What makes this rice so valuable is that Beta-carotene is the precursor to vitamin A — and vitamin A is lacking in the diets of millions around the world. An insufficient supply of vitamin A, especially in children, can lead to blindness and death, as well as increased [susceptibility](#) [2] to and death from diseases such as measles.

A new [report](#) [3] in the *American Journal of Clinical Nutrition* assesses the possible impact of replacing regular white rice with Golden Rice in regions of Asia where rice is a major staple food. The authors, led by Dr. Fabiana F. De Moura from the International Food Policy Research Institute in Washington D.C., used data from Bangladesh, Indonesia, and the Philippines to quantify the usual intake of rice and vitamin A in adult, non-pregnant and non-lactating women, as well as of non-breastfed children between 1 and 3 years old. Then, using that data, they simulated possible scenarios if various proportions of the population (ranging from 10 to 70 percent) replaced their usual rice by golden rice, and if varying amounts (from 3.8:1 to 12:1 — number of molecules of beta-carotene to produce 1 molecule of vitamin A) were used for the conversion of beta-carotene to vitamin A by the recipient's body.

They found that the usual intake of vitamin A intake was less than optimal — especially in the three regions studied in Bangladesh, where 93 percent of women and young children had inadequate intakes. The situation was not as bad in Indonesia, where 68 and 34 percent of women and children, respectively, had inadequate intakes, or in the Philippines where the figures were 74 and 43 percent. These figures certainly indicate that such suboptimal intakes demand attention.

As expected, the researchers found that the percentages of inadequacy fell the most in their model— particularly in Bangladeshi women and children — when 70 percent of the population switched to golden rice. For those individuals, the poorest group studied, rates of inadequacy dropped from 93 percent to about 20 percent for women and 13 percent for children. And of course, the more beta-carotene the rice contained, the greater the decrease in inadequacy. The models of both the Indonesian and Filipino groups also indicated a substantial decline in levels of deficiency, though not as significant as that seen in Bangladeshis.

The authors stated that programs designed to normalize vitamin A intake would have to "put more emphasis on encouraging the adoption of biofortified beta-carotene rice among farmers and subsequently creating a demand for it on the consumer side to drive both adoption and consumption."

Governments and interested parties will also have to work to counter the anti-scientific rhetoric of the fear-mongers who have demonized all GMOs and particularly golden rice. Hysterical reactions to this technology have resulted in vandalized test plots in Indonesia and fear among the scientifically uneducated. But a technology which holds so much promise for the poor and ill-fed of the world must not be stymied by those with little understanding of or care about the benefits it would supply.

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