Improving Rice Nutrition

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Milled rice is deficient in almost all major classes of nutrients except carbohydrates. Poor nutrition of rice has resulted in severe malnutrition problems in developing countries where the access to other food is limited, particularly among children. Nutrition fortification, a process of supplementing the deficient nutrients to a food to improve the food nutrition, has been proposed to solve the rice nutrition problem. However, this approach hasn't met the expectations thus far. The nutrients directly dusted on rice grains get lost if washed due to grain's slippery surface. Washing the rice is a long tradition of cooking. Recent studies have shown that washing rice is highly beneficial to human health because washing can effectively remove arsenic, a carcinogen widely presented in rice with broad negative health effects. Alternatively, making reconstituted kernels with improved nutrition is too expensive for developing countries and poor in eating quality. To make the supplemented nutrients stay with rice grains, I developed a new rice fortification method by shooting the nutrient particles into the interior of rice grains with a "Gun". I further improved the method by manipulating the starch crystalline structure to facilitate nutrient particle penetration. Nutrient content analyses showed that my new rice fortification methods improve rice nutrition highly effectively with excellent nutrient retention rates during washing. The new methods are affordable to developing countries. Since over half of the world uses rice as a staple, the research may have a significant impact on human health and well-being.

Awards Won: