

Media Release

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High iron and zinc rice gives hope to micronutrient deficient billions

Scientists from the Australian Centre for Plant Functional Genomics (ACPF) have produced rice with high enough iron levels that it meets daily recommended requirements for iron intake.

The team, based at the Universities of Adelaide, Melbourne and South Australia, and Flinders University, and funded by the Australian Research Council and HarvestPlus, genetically modified rice to increase the amount of iron that is transported to the endosperm of the grain (the part that people eat). This resulted in rice that has up to four times more iron than conventional rice. The rice also has doubled zinc levels.

'Rice is the primary source of food for roughly half of the world's population, particularly in developing countries, yet the polished grain, also known as white rice, contains insufficient concentrations of iron, zinc and pro-vitamin A to meet daily nutritional requirements' said Dr Alex Johnson from ACPF.

'A lack of genetic variation in rice has hindered efforts by conventional breeding programs to address iron levels. These programs have not been able to achieve the level of iron and zinc in the rice grain that we are able to achieve with a biotech approach in our glasshouse experiments,' said Dr Johnson

This research represents the first time rice lines have been reported with iron levels at or higher than the daily recommended levels.

According to the World Health Organisation, iron deficiency is the most common and widespread nutritional disorder in the world and affects more than two billion people (30% of the world's population). Symptoms include poor mental development, depressed immune function and anaemia.

'The development of new cereal varieties containing increased concentrations of iron and other essential micronutrients, an approach known as biofortification, offers an inexpensive and sustainable solution to the chronic micronutrient malnutrition problems that currently plague people in developing countries,' said Dr Johnson.

The results of this research were published yesterday in the online peer reviewed journal *PLoS ONE*:
<http://dx.plos.org/10.1371/journal.pone.0024476>

Work is now underway to test this technology in field trials.

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ACPF scientists are improving cereal crops' tolerance to environmental stresses such as drought, heat, salinity and nitrogen use efficiency. These stresses are a major cause of yield and quality loss throughout the world and cause significant problems for cereal growers. For more information on ACPF visit www.acpfg.com.au

