

Worldwide mission to solve iron deficiency

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Dr. Alex Johnson is the lead investigator in a project to increase iron content in rice and other cereal grains. Credit: Cobi Smith

A University of Adelaide researcher will lead an Australian project to help address the world's biggest nutritional deficiency – lack of iron.

Dr Alex Johnson has been awarded nearly \$300,000 to work with the Bill Gates-funded HarvestPlus Challenge Program to increase iron content in rice and other cereal grains.

More than two billion people – or 30% of the world's population – suffer from iron deficiency, which can cause anaemia, poor mental development, fertility problems and a depressed immune system.

Dr Johnson, who is based at the Australian Centre for Plant Functional Genomics at the Waite Campus, will work on increasing iron content in cereal foods by improving the delivery of iron from the leaf to the seed.

"Iron content is quite low in cereal grains because although iron is present in a plant's leaves, very little of that iron is transported to the seed, which is the part that is consumed by humans.

"We know of several proteins that move iron around in a plant so it is a matter of increasing the flow of iron into a seed tissue called endosperm, which survives the milling and polishing process."

If this can be achieved, the benefits to developing countries in particular will be enormous, Dr Johnson says.

Rice and wheat, the two most widely consumed cereals in developing countries, transport only a small fraction of iron to the developing grain – 5% for rice and 20% for wheat. Furthermore, the small amount of iron that is retained accumulates almost exclusively in the outer layers, which are removed during the milling process so that grain can be stored for long periods.

"In the western world we can get around this problem by adding various compounds to flour to make it rich in iron. But iron fortification of flour is only economical for developed countries. Poor nations can't afford this so we have to find a sustainable way of increasing iron in the milled seed."

Higher iron content could also lower the production costs of many Australian farmers by reducing or eliminating the need for iron fortification of wheat flour.

Source: University of Adelaide

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