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Improving human iron status through iron-biofortified staple crops - Progress and challenges

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Iron biofortification refers to the development of iron-enhanced staple crop varieties by traditional breeding practices or by modern biotechnology, is a promising approach to combat iron deficiency (ID), especially in poverty-stricken people in developing countries, including women and children who are most at risk for ID. However, iron biofortification requires sufficient consumption of the biofortified staple crop in the targeted population and it can only improve iron status if the additional iron provided by the biofortified crop is bioavailable, and consequently fills the gap between current iron intake and iron requirement. Furthermore, acceptance of biofortified crops by farmers and consumers is crucial. Present research prograMS are focused on enhancing iron concentrations in millet, maize, wheat, rice, and beans. To date, several studies have investigated consumption, iron-retention after processing, absorption/bioavailability and efficacy of iron-biofortified crops and results were promising, but also revealed some new challenges. One of these challenges is the limited genetic potential of some staple crops which makes it difficult to use traditional breeding practices, and although modern biotechnology has shown to significantly increase iron concentration in such crops, the current low acceptance of transgenic plants restricts their use. Other challenges are low iron retention or bioavailability after processing. Iron-biofortified crops often have increased phytate concentration. Phytate is a well-known inhibitor of human iron absorption and impairs the bioavailability of the additional iron breed into the crop. Further research is needed to overcome these challenges and to completely adopt iron biofortification as another mainstream intervention to prevent ID.

Biography

Colin Cercamondi has completed his PhD at the age of 29 years from ETH Zurich, Switzerland and is currently doing postdoctoral studies at ETH Zurich. He is mainly working on the development and implementation of strategies to combat anemia and iron deficiency in developing countries, including studies on the role of iron in meditating host-pathogen interactions in malaria and tuberculosis. He has worked in several developing countries, such as Ethiopia, Benin, Burkina Faso, Kenya and Tanzania, and has published papers in reputed nutritional journals.

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