AgriCos e-Newsletter
ISSN: 2582-7049
Open Access Multidisciplinary Monthly Online Magazine
Volume: 04 Issue: 03 March 2023 Article No: 16

Biofortification in Vegetable Crop Development

Folane J. N. and Etther Y. B.
Assistant Professor, SDMVM's College of Agricultural Biotechnology, Georai Tanda, Paithan Road, Aurangabad (M.S)

SUMMARY

Biofortification proposes a promising strategy to increase the content of specific composites. As minerals have important functionalities in the mortal metabolism, the possibility of perfecting fresh consumed products, similar as numerous vegetables, espousing specific agronomic approaches, has been considered Micronutrient malnutrition is known to affect further than half of the world's population and considered to be among the most serious global challenges to humankind. One similar approach to combat the issue of micro nutrient malnutrition is through biofortification, a process of breeding nutrients into food crops which provides a comparatively cost-effective, sustainable and long- term means of delivering further micronutrients to pastoral populations in developing countries. Biofortification of vegetables with vitamins and micronutrients is the present day need for developing countries to overcome colorful health issues. Presently, agronomic conventional plant breeding and inheritable modification are three common approaches for biofortification of vegetable crops. Agronomic biofortification is the application of fertilizers to increase the micronutrients in comestible parts. In conventional plant breeding, parent lines with high vitamin or mineral levels can be crossed over several generations to produce plants that have the desired nutrients.

INTRODUCTION

Bio-fortification refers to increasing genetically the bioavailable mineral content of food crops. Developing biofortified crops also improves their effectiveness of growth in soils with depleted or unapproachable mineral composition. Breeding plants with increased phytonutrients is most fluently achieved with crops with short juvenile periods to reach fruiting stage similar as vegetables, berries and melons, but is a much longer term strategy for tree- fruit and nuts, which usually require a juvenile period of numerous years before fruit- set is possible. Indispensable strategies include the identification of plant variants with enhanced phytonutrient levels within germplasm collections or within existing marketable cultivars. This can identify lines that may be already respectable to consumers, or alternately identify a implicit donor parent with the applicable phytonutrient background for transfer in to a further respectable plant- type for consumption. Traditional agrarian practices can partly enhance the nutritive content in plant foods but biofortification is a practice of nutrient fortification into food crops using agronomic, conventional and transgenic breeding methods to give a sustainable and long term strategy to address negative impacts of vitamin & nutrient deficiencies. The important concern for biofortification is that after the development of variety, there should be wide adoption by the planter. The crop has to reach the indigent poor people. Vegetables, fruits, dairy, and meat products are rich in vitamins and micronutrients, but they're precious for poor people. They calculate on many stiff staples(rice, wheat, maize, and potato); as a result, the intake of salutary diversity becomes a luxury, and poor people can not go it. The extent of diseases due to malnutrition and mineral deficiencies is so high that the World Bank estimated the combined profitable cost of mineral deficiency in developing countries and could waste as important as 5 of its gross domestic product(GDP). The deficiency of micronutrient and vitamins has a significant impact and burden on society which eventually leads to an increase in susceptibility to contagious diseases, physical impairment, cognitive losses, blindness, and unseasonable mortality. exhaustively, the deficiency of pro-vitamin A, Fe, I, Zn, and Se is reported to have a maximum percentage of disease burden, negative impact on the public.

What's Biofortification

Biofortification can be defined as the development of micronutrient- thick staple crops (cereals and vegetables) using traditional plant breeding practices, ultramodern biotechnology, and agronomical approached. In this process, the concentration of plant- deduced nutrition and vitamins is increased in the comestible organ during the growth and development of the plant. Biofortified staple food may not contain a high level of essential vitamins and micronutrients as compared to industrially fortified foods, but they can help to reduce " hidden hunger " by adding the diurnal adequacy of micronutrients uptake by the individual throughout the life cycle. also, biofortification provides a possible means of propagating the technology and food to a glutted population where there may have limited access to different kinds of diet, supplements, and food, which are commercially fortified.

The Role of Vegetables for Human Health and How Biofortification Can Have an Impact

Plant foods make up a substantial part of the mortal diet and they provide utmost of calories, nutrients, and bioactive compounds necessary to keep a healthy status and prevent diseases. Vegetables are one of the pillars of a plant- based good diet, providing in particular salutary fiber, phytochemical (similar as vitamins, antioxidants), and minerals. Minerals are considered essential nutrients they aren't synthesized by humans and must be obtained from the diet. Humankind evolved thanks to the salutary assumption of a significant number of vegetables and their inadequate intake is one of the reasons for numerous noninfectious diseases, which are spread in Westernized societies. As an example, potassium, calcium, selenium, and iodine obtained through a vegetable-rich diet, can contribute to maintaining good blood pressure, bone strength, hormonal production, heart, and internal health. In a recent study carried out in the UK, a data analysis from further than,000 people showed that changes in fruit and vegetable consumption may not only benefit physical health in the long- run, but also internal well- being in short term besides the general population these benefits were also observed in cancer survivors. On the other hand, vegetables play an important role in the economy, fighting poverty, hunger, and undernutrition, since they can be locally cultivated and consumed in a high diversity of shapes, sizes, colors, and tastes. However, the factual contribution of phytochemicals and minerals to mortal diet isn't only related to their concentration in a certain plant tissue. The micronutrients must be released from the food matrix during the passage in the gastrointestinal track, absorbed into the blood and transported to their target tissues. In fact, only the fraction released from the plant tissue become ultimately available for absorption. In fact, only the fraction released from the plant tissue become ultimately available for absorption. This fraction is indicated as bioaccessible and to increase the bioaccessibility of plant phytochemicals and minerals is a promising target of agronomical strategies to improve the nutritive quality of vegetables

CONCLUSION

The major area of research for developing countries after food security is nutritive security. Because the major population of the developing world is suffering from “retired hunger” and combating this problem, the agrarian scientist is able of changing the physiology of crops by biofortification of vegetables and cereals. Biofortification provides a doable means of reaching glutted populations in relatively pastoral areas, delivering naturally fortified foods to people with limited access to commercially- retailed fortified foods, which are more readily available in civic areas. Development, production and consumption of biofortified vegetables need to be popularized for preventing colorful health issues. Therefore, the suitable remedy to exclude under nutrition as a public health problem is to give advanced consumption of a wide range ofnon-staple foods in developing countries. There's important scope for plant breeders, molecular scientists, and inheritable engineers to improve micronutrient density and vitamin content of staple food crops and vegetables for developing countries.

REFERENCES

Black RRE, Allen LHL, Bhutta ZZA et al (2008) Maternal and child undernutrition: global and regional exposures and health consequences. Lancet 371:243–260.

Borg S, Brinch-Pedersen H, Tauris B, and Holm PB. 2009. Iron transport, deposition and bioavailability in the wheat and barley grain. Plant and Soil, 325: 15-24

Brinch PH, Borg S, Tauris and B, Holm PB. 2007.Molecular genetics approaches to increasing mineral availability and vitamin content of cereals. J. of Cereal Science, 46:308-326.

Fan S. Ending hunger and undernutrition by 2025: The role of horticultural value chains. *Acta Hortic.* 2016;1126:9–20.

Gómez MI, Barrett CB, Raney T et al (2013) Post-green revolution food systems and the triple burden of malnutrition. Food Policy 42:129–138.

Manisha Kumari, Deepa Sharma* and Sampathi Sandeep (2022) Biofortification of Vegetable Crops: An Option for Mitigating Hidden Hunger. International *Journal of Economic Plants*, 9(3):184-193.

Schreinemachers P., Simmons E.B., Wopereis M.C.S. Tapping the economic and nutritional power of vegetables. *Glob. Food Sec.* 2018;16:36–45.

Zhang D., Feng Y., Li N., Sun X. Fruit and vegetable consumptions in relation to frequent mental distress in breast cancer survivors. *Support. Care Cancer.* 2021.