

Selenium bioaccumulation in cereal crops as potential functional food

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Selenium is one of elements that have health benefits. Some health conditions that selenium is known to easily include arthritis, asthma, AIDS and cancer of different types. In the USA it is used as food supplements. In developing countries use of plants that can accumulate selenium could be one of options. Some vegetables that accumulate selenium in appreciable level have been identified in Tanzania. However, fewer Tanzanians eat vegetable to the level that is recommended by WHO. The purpose of this study was thus to identify Cereals that are selenium accumulators. Four cereals namely: finger millet, cereal amaranthus, sorghum, and maize were selected based on their importance as staple food crops in Tanzania and in Africa in general. Since Tanzanian soil has no natural selenite was used as a source of the element. Soil selenium enrichment was done according to Lyon (2010) whereby 10g Se in form of selenite was applied to an area 10,000 m² where the four cereals were grown. At maturity seeds of the four crops were harvested, dried to fullness and the level of selenium accumulated in each analyzed using dibenzadine method. Maize was apportioned into three different sub-samples; unpolished (Dona in Swahili), polished (Sembe in Swahili) and Testa (Pumba in Swahili). Results showed that the levels of accumulation were highest in maize (3.070 Se ug/g), then Amaranthus (1.562 Se gg/g), Millet (1.250 Se gg/g) and lastly Sorghum (0.666 Se g"). Turkey Kramer multiple comparison showed that, the level in Maize was significantly higher than all other crops ($p < 0.001$), Amaranthus significantly higher than Finger millet and Sorghum ($p < 0.001$) whereas Finger Millet accumulated significantly higher than Sorghum ($p < 0.001$). Of the maize sub-samples unpolished accumulated the highest 3.070 Se gg/g, followed by Testa (2.3768 Se ug/g) and lastly Polished (0.712 Se gg/g). Selenium level in unpolished maize was significantly higher than in the other two samples and amount in testa significantly higher than what was accumulated in Polished sample ($P < 0.001$). All crops tested accumulate levels than can easily be used to achieve the selenium daily allowable intake for a person. Hence these crops can be used to make nutraceuticals to ease burden of diseases such as AIDS, different types cancers, Arthritis and others diseases where selenium have been found to confer health benefits.