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## Consumer Preferences for Biofortified Iron Beans: Results from a Willingness to Pay and Choice Experiment in Kenya

Micronutrient deficiencies are a major global health problem affecting an estimated two billion people. Iron deficiency is a public health issue in many developing countries including Kenya, particularly among women, children, and other vulnerable populations. Integrating Biofortified iron beans (BIBs) into the diets could bridge public health burden in the population. Despite the release and promotion of BIBs in the country, their adoption has been slow with varied uptake in both production and consumption. Our study applies the willingness to pay (WTP) and choice experiments to assess preferences for BIB attributes among consumers. Using a dataset of 561 respondents, we compare the WTP among consumers in a large urban city (Nairobi) with those in a rural area (Bomet) where BIBs have been promoted. In the eliciting WTP, we test whether message framing (gain vs loss framed) has varied effects among in the rural-urban context. The study further utilises choice experiments to distil the most important bean attributes among rural-urban and men and women consumers. In view of BIBs being similar looking to the conventional varieties, we test the extent to which biofortification attribute is important for bean preferences. Our descriptive analysis shows that nine in every ten consumers considered flatulence as key attribute when choosing the bean variety. Cooking time, taste, and price were also important attributes for more than half of the consumers. However, biofortification attribute was not an important attribute for most consumers (33.5%). Consumers are willing to pay (WTP) a premium of 38.5% for the BIBs above the price of their preferred conventional beans (KES 165.7). Consumers' WTP was more under gain-framed messaging (KES 65.77) than loss-framed messaging (KES 62.72). Unlike urban consumers, rural counterparts had a higher WTP KES 86.40 under gain frame-messaging compared to KES 63.56 under loss framed messaging. At the same gain-framed WTP (KES 66.99) was higher among females than loss framing (KES 61.47). In addition, wealth index positively influences WTP and more significantly among urban consumers. Unlike the rural sample where the coefficients of the index are not significant, wealth index positively influences WTP among female consumers. Interestingly, awareness on nutrient enriched foods was negatively influenced WTP, likely that some consumers associated biofortification with genetically modified foods, and other negative views on the science. Perceived behavioral control (PBC) indicated a significant and positive effect WTP in the sample as well as male and female respondents. Results from the conditional logit model indicate that yellow and sugar beans are more likely to be chosen by consumers compared to the red colour of the BIBs. The model also indicates that biofortification coefficient was positive and statistically significant ( $p < 0.10$ ) for urban consumers and female-headed households. Overall, the biofortification is not considered as important attribute for the study population. This may be associated with the low awareness on the benefits of biofortification among the population. However, considering that flatulence, cooking time and taste are main preferred attributes of the BIBs, promotional messages including these attributes could be used to accompany the biofortification messages to catalyze the adoption of BIBs. Based on the findings, we recommend the need for targeted nutrition education programming to increase the adoption BIBs especially among rural and consumers.

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