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CORRECTION

Correction to: Factors affecting farmers' willingness and ability to adopt and retain vitamin A-rich varieties of orange-fleshed sweet potato in Mozambique

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The original version of this article unfortunately contained an error. In the published version, the subheadings that appeared under section 5 (Study Limitations) were supposed to be placed under section 4 (Discussion).

The correct presentation is shown below:

4 Discussion

The results of this manuscript highlight factors that influence the adoption and retention of OFSP. These factors can be concisely determined by asking and answering questions about the motivation for producing and consuming OFSP, the differences between OFSP and WFSP, and the constraints to increased adoption of OFSP.

4.1 Motivation to produce and consume OFSP

The participants in this study exhibited a strong understanding of the nutritional and health benefits of OFSP consumption, including the prevention of illness and positive impact on visual health. The perception that OFSP is a form of medicine, and that only individuals with outward signs of illness should consume OFSP, could potentially lead to the formation of negative attitudes (persuasion) toward OFSP among individuals who do not exhibit obvious symptoms of illness. Conversely, the belief that OFSP is medicine could lead to the formation of positive attitudes (persuasion) and increase consumption levels among those who may believe that OFSP prevents certain illnesses, increasing its relative advantage over WFSP. The health and nutrition awareness component of OFSP interventions is largely dependent on extension workers who are trained to spread messages about vitamin A and prevention of blindness.

Participants discussed market instability (MU = 24), resulting in hesitation to expand their production of SP and other crops, and voiced an interest in a processing facility that could purchase OFSP year round to ensure that their production efforts will be consistently profitable. However, this concern seems to be at odds with the insistence by other participants that OFSP is widely sought after and demands a higher price at markets. This seeming contradiction points to the complicated dynamics of OFSP supply and demand in Mozambique, and highlights the need for a comprehensive analysis of the risks and benefits, both real and perceived, among producers.

4.2 Differences between WFSP and OFSP

The difference in culinary use of SP flesh colors noted by some participants could have a negative or positive impact on OFSP consumption levels. Several participants in Macate demonstrated confusion around the preparation of OFSP, asking "what can I do with this potato" or "how can I prepare it", indicating that they considered it to be a distinct food from WFSP, which is typically consumed after boiling or roasting and is not used to create derivatives. The potential perception that OFSP is more difficult to incorporate into meals could result in diminished consumption of OFSP roots. However, as participants learn to

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incorporate OFSP into diverse recipes (e.g. enriched porridges, juice and breads), consumption levels could increase. To increase adoption, future breeding efforts to cross OFSP should build upon local knowledge about varieties with positive attributes, such as *Secai* in Macate.

The reported differences in year around availability of OFSP and WFSP is potentially attributable to the fact that OFSP varieties have been bred to mature quickly (in approximately four months), while most participants reported that WFSP takes longer to mature. The shorter maturation period for OFSP is theoretically a great advantage, and many participants spoke positively of this attribute; it could, however, result in shorter periods of availability if farmers are not willing or able to plant SP multiple times per year.

According to two subsistence farmers in Macate, WFSP is more resistant than OFSP because the vines grow longer and are therefore less susceptible to external factors (e.g. cows entering a farm) that could destroy them. However, according to one DVM, the OFSP varieties that develop shorter vines and fewer leaves are preferable because they are easier to manage. The priorities of these participants for their SP production are notably different: the subsistence farmers produce small amounts of roots mainly for consumption, and therefore appreciate vines that they perceive as less vulnerable; the DVM is concerned with efficiency in vine multiplication, and therefore appreciates vines that are easily managed. Another subsistence farmer reported that because the WFSP vines grow longer, they need more water than OFSP. She also preferred the more modest development of OFSP vines because they require smaller seedbeds than WFSP and can produce a large amount of roots in a small area. A DVM in Gurúè made a similar observation, and also noted the larger root size of OFSP compared to WFSP, which he attributed to inherent qualities rather than planting technique.

Several participants reported that OFSP could be preserved on the farm for a shorter period of time than WFSP due to high susceptibility to pests and poor resistance to sun. Others believe that WFSP lasts longer post-harvest than OFSP. The formation of such beliefs during the implementation phase could lead participants to reject OFSP in the confirmation phase if the perceived advantages of taste, health, and profitability do not outweigh the agronomic challenges associated with OFSP.

Multiple participants reported that OFSP requires the use of improved agricultural techniques which are not required for the production of WFSP. Further, the need to remove all weeds prior to planting OFSP was cited by multiple participants and seems to be a deterrent for some producers. This perceived need for a "clean plot" and careful measurement can result in the belief that OFSP is more work than WFSP, thereby creating a barrier to adoption. Conversely, some participants reported that OFSP is less work because the vines are smaller and the roots mature faster, necessitating less frequent weeding. Multiple participants also mentioned that OFSP can be harvested by hand while WFSP needs to be harvested with a hoe, as its roots grow deeper into the soil. Future research should examine the potential differences in root systems between WFSP and OFSP as this could have implications for the plant's ability to access water stored in the soil, as well as the difficulty or ease of harvest.

4.3 Constraints to increased adoption of OFSP

Although DVMs and other participants acknowledged the positive health properties of OFSP and indicated a sense of pride associated with its production, they also reported low levels of motivation among some community members to produce OFSP, and especially to preserve vines. Participants frequently mentioned a need for incentives such as branded t-shirts and *capulanas* (colorful, patterned fabric), as well as vine distributions, nutrition education, agricultural inputs and market support in order to produce OFSP. DVMs reported that community members need encouragement to produce OFSP again in the future if their crop is unsuccessful in one year; some DVMs believe that without their own continued efforts to preserve and distribute vines, it would be very unlikely that OFSP would persist in their communities. This concern is reinforced by the fact that multiple participants noted that WFSP is "easier" to produce due to a perceived greater need for field preparation and weed maintenance for OFSP.

Evidence of a lack of adoption of OFSP is also seen in the contrasting colloquial terminology for WFSP versus OFSP and the lack of ability of farmers to recall OFSP nomenclature. However, a growing trend to rename OFSP using local nomenclature is a form of reinvention that may potentially lead to increased adoption and sustainability (Rogers 2003).

A portion of participants reported that both OFSP and WFSP vines must be transferred to the moist lowlands during the dry season to preserve planting material for the following season as drought affects all flesh colors equally; others reported that vines may at times be preserved on-farm, depending on the extremity of temperature and dryness. However, multiple participants reported that OFSP vines must be transplanted to the humid lowlands during the dry season, while WFSP can survive in the higher elevation fields and does not require transfer to moist soils. In fact, several respondents reported that white vines they have ignored, or even actively tried to remove, have still independently germinated year after year. Participants in Gurúè also emphasized that flooding followed by insufficient rain resulted in very low yields of OFSP roots, while WFSP roots were still available, adding strength to claims that WFSP varieties are more drought resistant. These are key findings that highlight an important challenge associated with achieving a critical mass of OFSP in Mozambique. Farmers who have recently begun to produce OFSP, who have not yet confirmed it as a useful technology, may ultimately reject the crop if it is perceived as

less tolerant to unpredictable climate and weather patterns than WFSP.

A key perceived benefit to preserving vines articulated by one DVM in Gurúè is that the practice enables farmers to produce and sell SP before other farmers who did not preserve vines and therefore must purchase planting material or depend on the support of others who may only consent to share vines once their own fields have been planted. Farmers who reported high levels of vine retention stated that those who lose their vines and must search for new planting material each season engage in this behavior for several reasons: 1) they do not have access to humid lowland zones, and therefore cannot transfer vines for preservation during the dry season; 2) they do not make the effort to maintain planting material because they know they can get it from a neighbor or organization the following season; 3) they are careless in their harvesting, perhaps pushing sand over the vines where they collected the roots in hopes that some might survive for the coming season instead of carefully replanting the vines. This practice was reported to result in a higher survival rate for WFSP than for OFSP.

Leaf consumption was discussed frequently in interviews and focus groups (MU = 49); one interviewee in Gurúè reported that some families consume the majority of the SP leaves when other food is scarce, resulting in a low survival rate for vines. Still others may be overly generous in the sharing of vines or leaves with friends and neighbors, leaving them with little planting material for their own production.

Two DVMs in Gurúè mentioned difficulties enforcing the CIP Viable Sweetpotato Technologies for Africa (VISTA) project policies on monetary contributions for vines. One reported that families complained that vines cost two meticais (USD $0.03) for six kg due to the knowledge that families benefiting from former dissemination efforts received eight kg for free. Another reported that he could not collect the two meticais contribution as community members are accustomed to receiving planting material for free; he therefore had to give away vines to community members in order to accomplish his dissemination goals. This resistance to monetary contributions, even among those who have received information about VAD and the nutritional value of OFSP, may suggest that the perceived advantage of OFSP is not as strong as the conviction that vines should be shared for free, as is customary in many communities.

The study results show that both men and women in all three districts engage in the cultivation, preservation, and sale of OFSP. Due to the variability of responses in each district to questions about gender roles, further research should be conducted to understand geographically specific norms as a factor affecting the adoption or rejection of OFSP in Mozambique. Gender norms have important implications in the implementation phase of any new innovation; a possible strategy for future OFSP interventions could be to increase focus on the role of women as vendors of SP, especially in Macate where the crop is perceived as highly important for business.

5 Study limitations

Most interviews and focus groups were conducted in remote areas where some participants did not speak Portuguese, necessitating a reliance on translators, which has the potential to influence research findings (Temple 1997). Further, as the first author often traveled by motorcycle, bicycle, or on foot to conduct research, she was unable to work with a single translator to assist with local language, which varied among districts. The first author would not have been able to meet participants in remote areas without the assistance of extension workers and NGO facilitators, and participant comfort levels as well as honest reporting were potentially increased due to familiarity with these individuals as translators. Conversely, it is possible that the presence of these individuals led to misreporting in some cases. The researcher identified some participants independently, but in other cases the participants were identified by extension workers, project facilitators, or other participants. This method of sampling substantially broadened the geographic area included in the research, but also could have created a bias in the characteristics of participants. Risks of the sampling strategy include bias during informant selection, as the researcher judged the informants' reliability, and the potential for informants to misreport due to favoring the socially desirable response. Self-reporting by participants could also have led to misreporting in some cases, especially in attempts to estimate plot sizes and recall the amount of SP sold in the past season. These risks were controlled by taking several entry points to initiate 'snowball sampling' and crosschecking the responses through triangulation with other participants' responses and the researcher's detailed field log (Creswell 2014; Tongco 2007). Finally, meaning units were analyzed at the fragment level instead of at the participant level. There are advantages and disadvantages to each method. At the fragment level, the summation of the qualitative work is analyzed to reach a common understanding of all participants; at the participant level, the differences in individual participant responses are analyzed.

The original goal of the research was to interview 20 participants in each research site, and this goal was surpassed in each district. However, due to project logistics, half of the participant sample lived in Macate, which has the potential to bias study results. Researchers analyzed data by district to understand potential differences and noted several in the study results. Few in-person follow-up interviews were conducted due to time and transportation constraints; however, many participants were accessible by phone and the researcher made multiple calls to ask follow-up questions.

The original article has been corrected.