

FARMERS' PERCEPTIONS OF ORANGE-FLESHED SWEETPOTATO: DO COMMON BELIEFS ABOUT SWEETPOTATO PRODUCTION AND CONSUMPTION REALLY MATTER?

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ABSTRACT

Efforts to combat vitamin A deficiency in developing countries have focused on the promotion of growing and consuming orange-fleshed sweetpotato (OFSP), among other crops. Past studies have found increased intake and even incomes among households that have been reached with information about nutritional benefits of OFSP. Consequently, efforts to scale up the production and consumption of OFSP are on-going in several African countries where vitamin A deficiency is a major problem. However, to date, few studies have systematically examined farmers' perceptions and attitudes towards some of the attributes of OFSP. This paper interrogates some of the beliefs about the production and consumption of sweetpotato in general, and OFSP, in particular. It uses data generated using multi-stage sampling technique and involving 732 households in the Lake zone of Tanzania. The households were stratified into project participants (the intervention group) and non-participants (the control group). Within each household, data were collected from a male or female adult member (usually spouses) through personal interviews. Overall, 455 project participants and 277 non-participants were interviewed. This study uses both descriptive and exploratory factor analysis to assess some common beliefs about sweetpotato production and consumption. Contrary to the common beliefs, the study finds that sweetpotato is an important food crop to producing households, and that the common negative beliefs about sweetpotato production and consumption are not widely held. This study, therefore, recommends the need to upscale and out-scale efforts to sensitize farmers about the nutritional benefits of growing and consuming OFSP to counter the common negative beliefs about sweetpotato. In particular, educating farmers on the health effects of inadequate intake of Vitamin A and the importance of OFSP as its source can greatly influence their perceptions about OFSP. Further, there is need to increase efforts at breeding aimed at supplying the multiple desirable table and postharvest attributes of orange-fleshed sweetpotato, in addition to focusing on agronomic traits. For sub-Saharan Africa, such attributes include taste, storability of the tubers, dry matter content, and sugar content.

Key words: Sweetpotato, attributes, nutritional benefits, common beliefs, farmer perceptions, Tanzania

Abbreviations:

EFA – Explanatory factor analysis

KMO -Kaiser-Meyer-Oklin

OFSP – Orange-fleshed sweetpotato

VAD – Vitamin A deficiency

WFSP – White-fleshed sweetpotato

INTRODUCTION

Vitamin A deficiency (VAD) remains a major problem among developing-country rural populations. It is associated with increased mortality, particularly among children, pregnant and lactating mothers [1, 2]. An estimated 127 million preschool children worldwide suffer from VAD with between 250,000 and 500,000 becoming blind every year and about 600,000 dying annually as a result of VAD [1, 2].

Recent efforts to combat VAD in sub-Sahara Africa have, among others, promoted the production and consumption of orange-fleshed sweetpotato (OFSP). The International Potato Center (CIP) and HarvestPlus, jointly with partners, have led these efforts. As a result, several past and on-going projects have been implemented in Ghana, Uganda, Mozambique, Rwanda, Ethiopia, Zambia, and Malawi. These projects contain a component of sensitization about the nutritional benefits of consuming OFSP, and often include a component that promotes farmer access to quality planting materials of OFSP. One such project known as Marando Bora (Swahili phrase for *better vines*), was implemented in Lake zone of Tanzania between 2009 and 2012. The project reached about 110,000 farmers in four regions (Kagera, Mara, Mwanza and Shinyanga) with information on the benefits of OFSP, coupled with promotion on the use of clean planting materials among the participating households.

Several studies have examined consumers' acceptance of the bio-fortified foods including sweetpotato [3, 4]. Other studies have assessed the impact of production and consumption of OFSP on income and health [2, 5]. These studies find increased intake of OFSP and hence vitamin A. They also find that production of OFSP increases household income.

Adoption of a new technology by farmers is usually driven by a combination of many factors. One important aspect is farmers' attitudes, perceptions and knowledge towards the technology. There is a vast body of literature that has looked at the behavioral response to messaging about the benefits of a technology, but mainly in the health and nutrition areas [5]. To date, few studies have systematically examined farmers' perceptions and attitudes towards the attributes of OFSP usually associated with common beliefs about the production and consumption of OFSP and sweetpotato in general. Notable exceptions are studies that assess how farmers perceive OFSP as a food security crop and those that have used descriptive analysis to examine farmers' perceptions of production, nutrition and agronomic traits of OFSP [6, 7]. This paper uses a rich data set collected from the four regions of Tanzania to assess farmers' perceptions and attitudes towards OFSP. It uses both descriptive analysis and exploratory factor analysis (EFA) to interrogate some common beliefs about the production and consumption of sweetpotato, with a special focus on OFSP. The rest of this paper is organized as follows: Section 2 describes the study methods, Section 3 presents the data sources, Section 4 discusses the study findings while Section 5 concludes and provides policy implications of the findings.

STUDY METHODS

This study used both descriptive analysis and exploratory factor analysis. Descriptive analysis was used to examine preference for OFSP, evaluate farmer beliefs about OFSP and to understand attitudes towards some of the key attributes of sweetpotato in general and OFSP in particular. Exploratory factor analysis (EFA) was used to extract attributes of OFSP that are most valued by farmers, and to identify the latent constructs that motivate farmers to grow OFSP. The extracted attributes were then compared to those identified through descriptive analysis of farmers' direct responses to the questions on preference for various attributes. Kaiser-Meyer-Olkin's (KMO) overall measure of sampling adequacy was used to test the suitability of the data for factor analysis. The individual and overall KMO needs to be at least 0.5 for the matrix to be factorable [8, 9]. The number of factors retained was guided by the Eigen values. Factor loadings of 0.4 are considered significant [8, 9]. Items with insignificant loadings were deleted one by one, starting with the one with the lowest communality. To facilitate interpretation of the factor matrix, oblique (oblimin) rotation was used because it allows for correlations among the factors. Additionally, item-to-total correlation, and Cronbach's alpha were evaluated to assess the reliability of the measurement scales obtained [8]. Items with items-to-total correlation below 0.3 were removed from the measurement scale [10].

DATA

This study uses the data collected from 732 households in January and February 2013 as part of the Marando Bora endline study. A multi-stage sampling technique was used. First, the four regions (Mara, Kagera, Mwanza, Shinyanga) were purposively selected. Within each region, farmers were categorized into project participants (intervention) and non-participants (control). The list of farmers in each category was then compiled at the village levels in each of the administrative wards and districts. A random sample of farmers was then drawn from each category for personal interviews. In total 455 project participants and 277 non-participants were interviewed. Participants were farmers who had planted OFSP over the life of the project. They were also sensitized about the importance of growing OFSP and its nutritional benefits – especially the benefit of OFSP being rich in Vitamin A needed by children under the age of 5 years and pregnant/lactating women. The participants were also linked to the source of clean planting materials of OFSP from where they could obtain planting materials. On the other hand, the non-participants were farmers who lived in the project areas, and were aware of the project, but either chose not to participate in the project or did not receive the planting materials of OFSP and hence had no experience of this new variety of sweetpotato.

In order to capture gender differences in attitudes and perceptions, a set of 14 measurement items (see Table 1) were presented to female and male respondents separately, and responses recorded. A total of 327 male and 327 female respondents completed these measurement questions fully and were therefore used in the analysis in this paper. The measurement items were constructed as statements posed on a five-point Likert scale ranging from "strongly agree" to "strongly disagree". The midpoint on the

scale was “neither agree nor disagree”. To avoid agreement bias, both positively and negatively worded statements were intermixed as recommended in the literature [8].

Table 2 presents demographic characteristics of study respondents by participation in the project. It shows that participants and non-participants differ in terms of age, distance to market and education, although the differences are statistically weak. Specifically, Table 2 shows that project participants were, on average, located closer to the market and were older than the non-participating households.

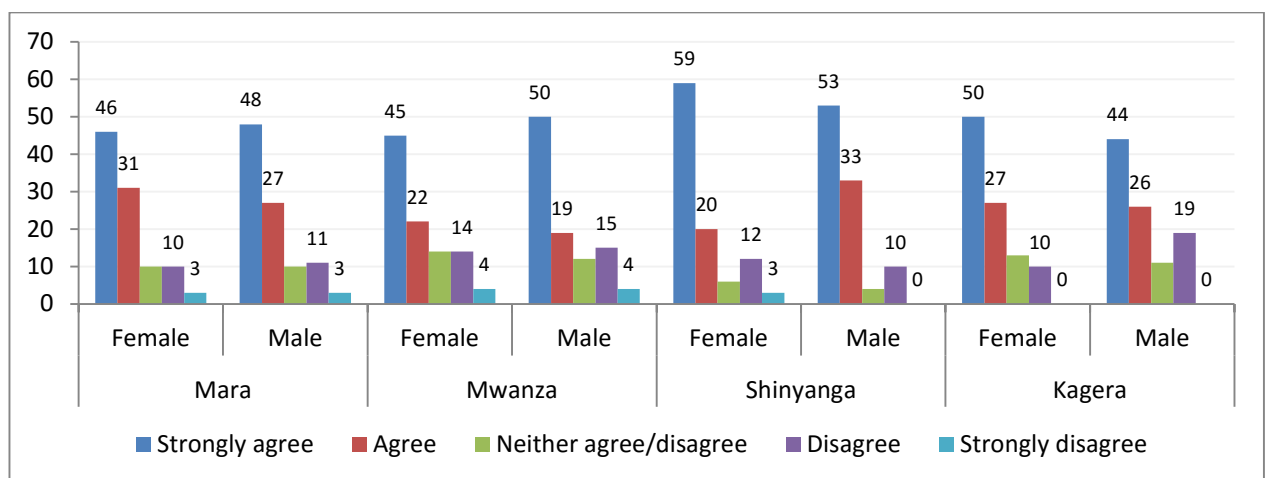
RESULTS

Perception and attitudes about OFSP

The first part of this section summarizes the responses to some of questions regarding beliefs and attributes towards sweetpotato, in general, and OFSP in particular. The second part, on the other hand, discusses the results of explanatory factor analysis, focusing on gender differences only¹.

Attribute #1: Sweetpotato leaves can be eaten as a vegetable

Contrary to the common belief, majority of the respondents indicated that the leaves can be consumed as a vegetable (see Figure 1). In all the study regions, the proportion of farmers that either strongly agreed or agreed that sweetpotato leaves are a vegetable exceeded 70%. Figure 1 also shows that, except for Shinyanga region, the results do not differ much by gender, implying that both men and women believe that sweetpotato leaves are a vegetable. Shinyanga has the highest percentage of respondents (both male and female) who believe that sweetpotato leaves are a vegetable. Kagera and Mwanza, on the other hand, have the lowest percentage of men and women respondents, respectively, who strongly agree that sweetpotato leaves are a vegetable. A chi-square test, however, indicated that there is no significant difference in perception across the four districts both for men ($p=0.159$) and women ($p=0.627$).



¹ Factor analysis by region, which will require 5-way analysis, is rather involved and is, therefore, not pursued in this paper

Figure 1: Sweetpotato leaves can be consumed as vegetables, % by study region

Results of the analysis by participation in the project also do not yield discernible differences in the perception of sweetpotato leaves as a vegetable. The percentage of male and female farmers who either strongly agreed or agreed that sweetpotato leaves are a vegetable is similar (about 70%) for both male and female participants and non-participants. Pearson chi-square test of differences in gender perception between participants and non-participants was insignificant for both men ($p=0.112$) and women (0.724). Using a binary variable equal to one if the response was “agree” or “strongly agree”, and zero otherwise, the results of the t-test also revealed no significant difference ($p=0.3622$ for men and $p=0.3281$ for women) between men and women’s perceptions by participation.

Attribute #2: OFSP is nutritionally superior to white-fleshed varieties

There are significant regional differences in farmer perception of the nutritional superiority of OFSP over the white-fleshed sweetpotato (WFSP) varieties (Figure 2). Kagera leads in terms of the percentage of male and female respondents who strongly agree that OFSP is nutritionally superior. Mara, on the other hand, has a large percentage of male and female respondents who are unsure (that is, neither agree nor disagree) about the nutritional superiority of OFSP.

The results also show a striking difference in respondents’ perceptions of the nutritional superiority of OFSP between project participants and non-participants (Figure 3). First, the percentage of farmers who strongly agree that OFSP is nutritionally superior to WFSP is much higher among both male and female participants than non-participants. These differences are statistically significant. The t-test of difference in means yielded a p-value of 0.0023 for males and 0.0000 for females. Second, about 50% of both male and female non-participants are unsure of nutritional superiority of OFSP over WFSP.

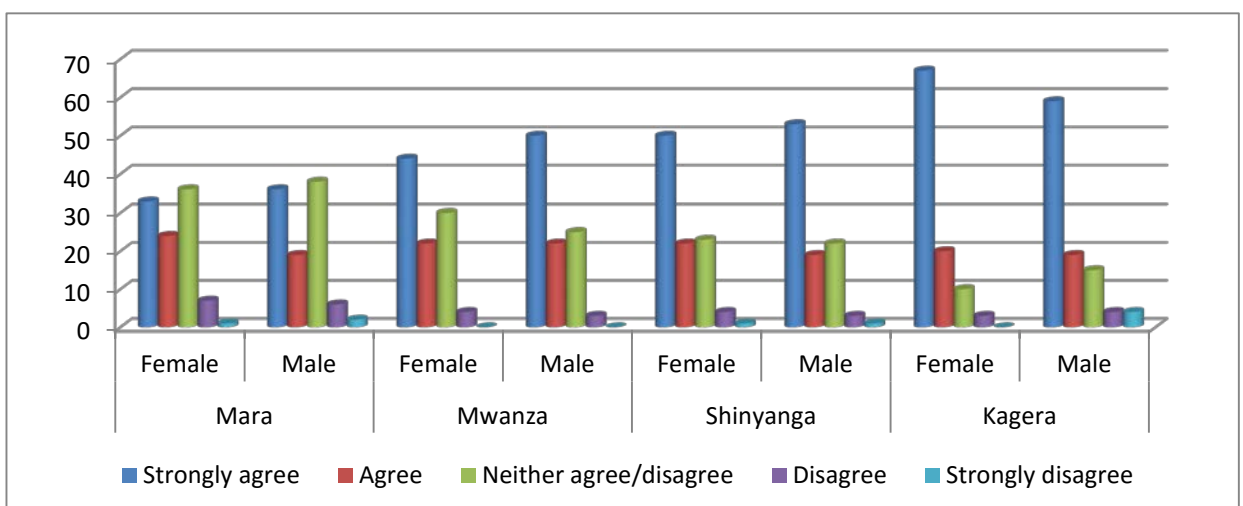


Figure 2: OFSP is healthier to eat than white-fleshed sweetpotato, % by region

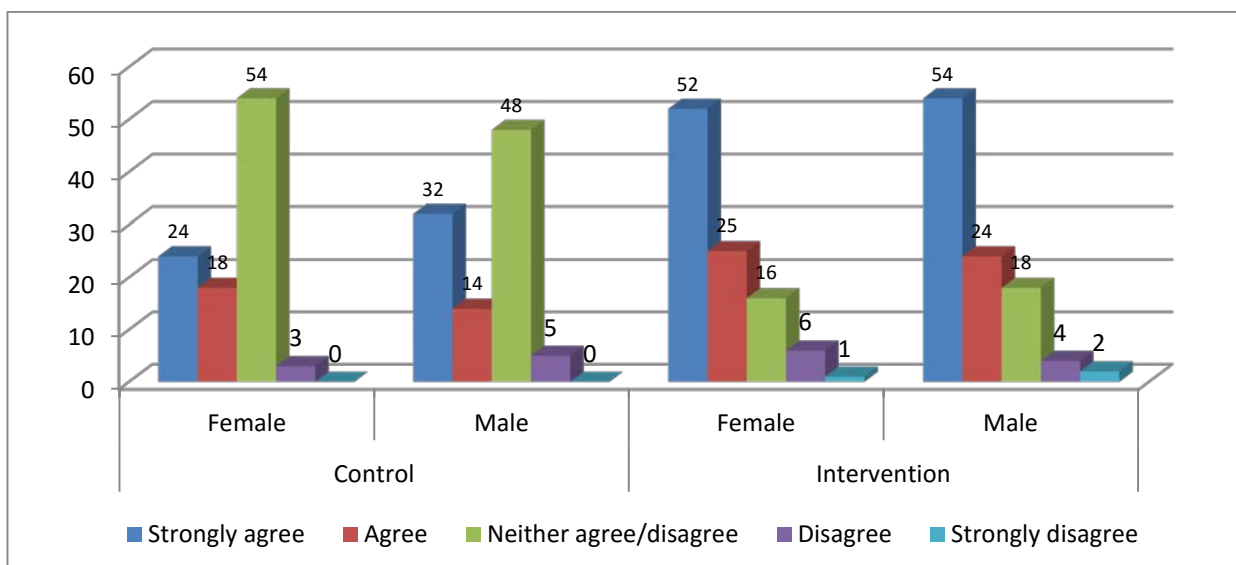


Figure 3: OFSP is healthier to eat than white-fleshed sweetpotato, % by project participation

Attribute #3: Sweetpotato can be depended on as food during food deficit periods

Results of analysis of the perception of sweetpotato's ability to fill the food supply gap in the household, by project participation, indicate that more than 50% of both female and male respondents across the two intervention categories perceive sweetpotato as a reliable food crop when there is shortage of food. Indeed, test of differences in perceptions between men and women yielded p-values of 0.249 and 0.320, indicating that there is no significant difference in perception of sweetpotato as a hunger gap crop between the two gender groups. Indeed, more than 84% of the both female and male project participants either agreed or strongly agreed with the statement that sweetpotato plays a significant role during food deficit periods. However, among the non-participants, fewer (58%) male respondents strongly agreed that sweetpotato is a reliable crop during times of food scarcity indicating a large gap in perception between project participants and non-participants.

Attribute #4: Sweetpotato is a significant part in household diet

Households usually have several food choice options during times of food sufficiency. During such times, it is expected that most households will mainly eat their most preferred foods. Respondents were, therefore, asked if their households would still consume sweetpotato even if the other staples were available in adequate amounts. Figure 4 presents the responses for project participants and non-participants. More female participants strongly agreed that they would include sweetpotato as part of their regular diet even if the other staples were available in sufficient quantities than their non-participating counterparts. By comparison, only a slightly higher proportion of male participants would include sweetpotato as regular part of diets during times of sufficient food supplies than the nonparticipants. In both cases, though, there is no statistical difference between participants and non-participants and also between men and women. For instance, results of the chi-square test of differences in perception yielded a p-value of 0.391 for men and 0.178 for women.

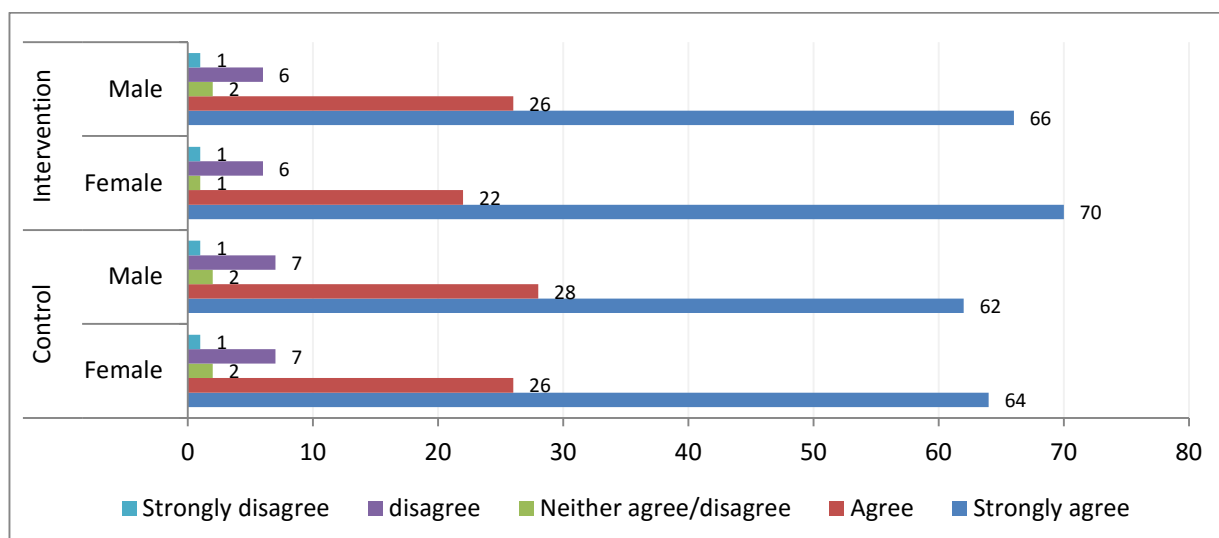


Figure 4: Sweetpotato will remain part of diet even when staples are enough, % by intervention

Attribute # 5: Sweetpotato is food for women and children only

Analysis of this belief by region indicates that majority of male and female respondents either disagreed or strongly disagreed with the statement. In all the regions, more than 85% and 88% of the male and female respondents, respectively, either disagreed or strongly disagreed with the statement that sweetpotato is food for women and children only. In Kagera region, for instance, 56% and 41% of male respondents disagreed and strongly disagreed, respectively, that sweetpotato is not food for men with only 3% male respondents agreeing with the statement. In the same region, 57% and 40% of the female respondents, respectively, disagreed and strongly disagreed with the perception that sweetpotato is not men's food, respectively. The test of differences in perceptions by regions using chi-square test revealed significant differences among regions in their perception for both for men ($p=0.008$) and women ($p=0.019$). Analysis of differences in perception by participation in the project gives similar results as above. However, the test of differences in perceptions of the t-test indicates that there is no statistical difference in perception between participants and non-participants for both men ($p=0.9673$) and women (0.3310). Hence, there is also a strong rejection of the perception that sweetpotato is food for women and children only, by both male and female participants and non-participants. Indeed, more than 90% of male and female participants and non-participants rejected the perception that sweetpotato is not men's food.

Attribute # 6: Children dislike sweetpotato that have orange-fleshed sweetpotato

Figure 5 presents the results of analysis of the belief that children do not like orange-fleshed sweetpotato due to its color. There are major differences in perception among male and female participants and non-participants. Male participants are more certain that children do not mind the orange color of the OFSP as compared to the non-participants. Indeed, the p-value of the test of difference in means between the two groups is 0.0653 indicating that the difference is statistically significant. Similarly, female participants are more certain that children do not mind the orange color of the OFSP as

compared to the nonparticipants. The p-value of the test of difference in means is, in this case, 0.0637 indicating moderately strong difference in perception between the two groups. That is, most female participants rejected this perception that children dislike the orange color of OFSP.

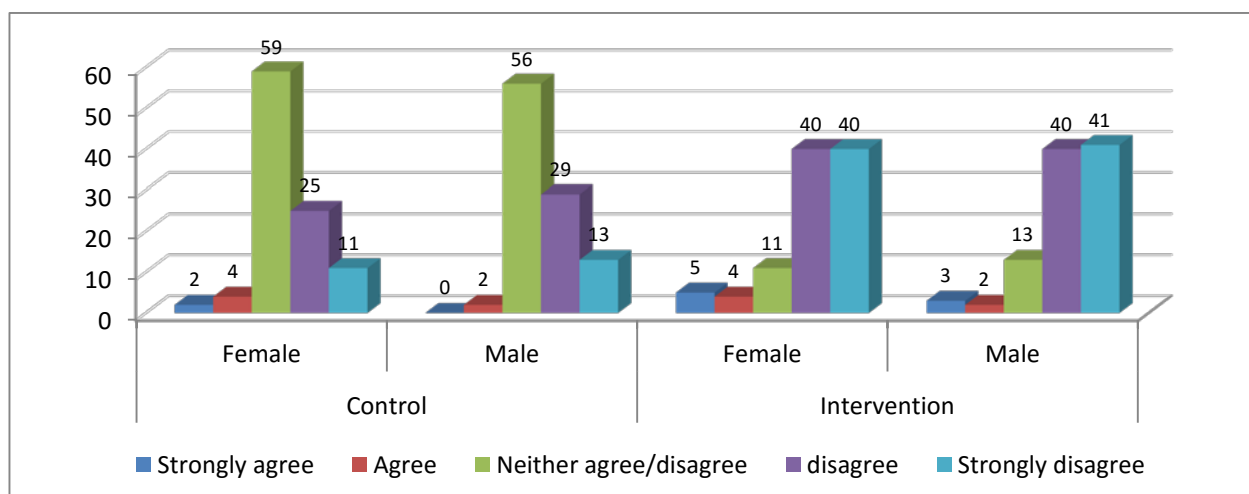


Figure 5: Perceptions about children's preference for orange flesh color, % by intervention

This study also examined respondents' perception of the yield potential and storability of OFSP. As in the above case of color, more than 50% of the male and female non-participants were unsure whether OFSP could store as well as the white-fleshed sweetpotato and/or could yield more. On the other hand, more than 70% of the male and female participants agreed or strongly agreed that OFSP can produce more and can also store just as well as the white-fleshed sweetpotato varieties.

Results of the analysis by both region and intervention of the other beliefs/attributes namely, i) you can't grow sweetpotato and still be considered a man (that is, sweetpotato is a woman's crop), and ii) eating too much potato causes diarrhea yielded similar results as above, indicating that these beliefs are unfounded. For instance, 89% and 87% of male and female project participants, respectively, rejected (that is, either disagreed or strongly disagreed with) the perception that one can't grow sweetpotato and still be considered a man. About the same proportions of male and female non-participants respondents rejected the perception that sweetpotato is a woman's crop.

Underlying attitude towards OFSP: the results of exploratory factor analysis

Table 3 shows the average, minimum, and maximum scores for male and female respondents over all the statements that were used to elicit attitudes. A higher score indicates that farmers care less about the suggested attribute [8]. For instance, the statement AP03: "Sweet potato is a food for women and children only", associated with the highest score of 4.31, means that most respondents disagreed with the statement. On the other hand, statement AP06: "Even when we have a lot of maize/cassava/rice/beans/Irish potato to eat, we still like to have sweetpotato in our diet",

associated with the lowest score of 1.32 (1.33) for female (male) respondents indicate that majority of the female (male) respondents agreed with it.

The results of exploratory factor analysis are displayed in Table 4 for both male and female respondents. Seven statements were excluded from the analysis after failing to attain the item-to-total correlation threshold of 0.3 or factor loading threshold of 0.4, indicating that they do not load significantly on the factor. The excluded statements are presented in italics in Table 4. The final matrices had overall KMO values of 0.806 for women and 0.794 for men, indicating that the data can be subjected to factor analysis [9]. Bartlett's test of sphericity yielded a p-value of 0.000, for both women and men, implying that the statements were inter-correlated as required for factor analysis to be applicable [8]. In both cases also, the Cronbach's alpha statistic was above 0.7, which is above the recommended minimum cut-off value of level of 0.6, indicating that factor analysis was appropriate [9].

Careful examination of Table 4 reveals that EFA extracted only statements that relate to OFSP, and represent positive attributes of OFSP. The attributes extracted relate to the nutritional benefits, taste, yield, storability, disease-resistance, and whether or not children like orange-fleshed sweetpotato. The results indicate that both male and female respondents agreed or strongly agreed with statements that were positive about these attributes and disagreed with statements that were negative about them. The extracted statements are therefore collectively summed into a single attribute interpreted as *OFSP attribute preferences*.

The above results suggest that the underlying latent structure was unidimensional. This means that the attitude of the study respondents towards sweetpotato production and consumption can be captured by one latent construct. That construct relates to the positive taste, yield, storability, disease resistance and popularity (among children) of OFSP. The finding further means that these attributes coalesce in the mind of the farmer into a single construct namely positive OFSP attributes.

CONCLUSION

This paper interrogates some of the beliefs about sweetpotato, and especially OFSP, production and consumption attributes using the both descriptive and exploratory factor analysis (EFA). The results of EFA confirm those of the descriptive analysis that indicate that the negative beliefs about OFSP production and consumption are not widely held. Instead, the study finds that farmers generally have a positive perception of OFSP production and consumption, especially relating to key attributes such as taste, yield, storability, disease resistance, and popularity (among children). However, the study also finds that perceptions seem to be influenced by awareness and knowledge of OFSP. In particular, farmers that participated in a project which sensitized members about the nutritional benefits of OFSP were more positive about its superior nutritional value and its popularity among children despite having orange flesh color.

This paper concludes that, despite common belief, growers treat sweetpotato as a major part of their household diet, do not see sweetpotato as food for women and children only

or as women's crop, use sweetpotato to bridge the hunger gap, and view its leaves as a vegetable. Further, the study concludes that farmers who grow OFSP have positive perception of its taste, yield ability, disease resistance, storability and popularity of the orange color among children. However, this positive perception is influenced by knowledge of OFSP.

These findings imply the need to upscale and out-scale efforts to sensitize farmers who do not currently grow OFSP about the nutritional benefits of growing and consuming OFSP. In particular, training on health effects of inadequate intake of Vitamin A and OFSP as its source can greatly influence perception of OFSP. Indeed, the studies indicate that attitudes affect decision-making [11].

The finding that non-yield attributes (such as taste) are a significant part of the latent construct that comes into a male and female farmer's mind when thinking about OFSP corroborates evidence from past studies that preference towards the taste of OFSP increases willingness to pay for it [2]. It also supports the finding that taste is one of the key attributes farmers take into account when considering adopting a new improved variety [12, 13]. The finding implies and emphasizes the need to increase efforts at breeding for multiple attributes/traits rather than focusing on agronomics traits only, as was the case before. The finding that perception varies with knowledge of the benefits of OFSP implies the need to further understand the end-chain utilization issues relating to residual beta-carotene content of the OFSP during processing. Research has started focusing on this area (14, 15)

Table 1: Statements used to measure attitude towards OFSP

AP02	Sweetpotato leaves are good for human beings to consume
AP03	Sweetpotato is a food for women and children only
AP04	Sweetpotato that are orange inside are healthier than ones that are white inside
AP05	Sweetpotato is the most reliable food crop for our family during times of food shortage
AP06	Even when we have lots of maize/cassava/rice / beans/Irish potato(<i>or use major food crop in area</i>) to eat, we still like to have sweetpotato in our diet
AP07	You can't grow sweetpotato and be considered a man
AP08	You can't eat too much sweetpotato because you will get stomach problems
AP09	Orange-fleshed sweetpotato do not taste as good as those that are white-fleshed.
AP10	Orange-fleshed sweetpotato produce more than those that are white-fleshed.
AP11	Orange-fleshed sweetpotato do not store as well after harvesting as the white-fleshed.
AP12	You can't consume too much orange-fleshed sweetpotato because they are very sweet
AP13	Orange-fleshed sweetpotato mature earlier than the others
AP14	Orange-fleshed sweetpotato are not loved by children
AP15	Orange-fleshed sweetpotato are not tolerant to diseases

Table 2: Demographic characteristics of study respondents and t-test of differences in means by project participation

Variable	Participant		Non-participant		Test of diff in means	
	Mean	Std Dev	Mean	Std Dev	t-stat	p-value
Gender (1,0)	0.29	0.46	0.32	0.47	0.72	0.469
Education (years)	5.88	3.12	5.59	3.07	-1.23	0.109
Age (years)	46.23	12.50	48.22	12.30	2.13	0.033
Distance to market (km)	14.53	28.94	11.94	21.16	-1.30	0.097
Farm size (acres)	4.55	2.63	4.65	2.72	0.44	0.662

Table 3: Average, minimum, and maximum scores for statements about OFSP attributes by gender

Code	Statement	Women				Men			
		Average score	Standard deviation	Min	Max	Average score	Standard deviation	Min	Max
AP02	Sweetpotato leaves are good for human beings to consume	1.90	1.17	1	5	1.90	1.17	1	5
AP03	Sweetpotato is a food for women and children only	4.31	0.96	1	5	4.26	0.95	1	5
AP04	Orange-fleshed sweetpotato are healthier than white-fleshed	2.01	1.01	1	5	1.93	1.01	1	5
AP05	Sweetpotato is the most reliable food crop for our family during times of food shortage	1.62	1.20	1	5	1.65	1.23	1	5
AP06	Even when we have lots of maize/cassava/rice / beans/Irish potato(<i>or use major food crop in area</i>) to eat, we still like to have sweetpotato in our diet	1.32	0.70	1	5	1.33	0.72	1	5
AP07	You can't grow sweetpotato and be considered a man	4.16	1.01	1	5	4.20	1.00	1	5
AP08	You can't eat too much sweetpotato because you will get stomach problems	4.12	1.03	1	5	4.17	1.02	1	5
AP09	Orange-fleshed sweetpotato do not taste as good as white-fleshed	3.29	1.20	1	5	3.38	1.16	1	5
AP10	Orange-fleshed sweetpotato yield more than white-fleshed	2.40	1.12	1	5	2.44	1.16	1	5
AP11	Orange-fleshed sweetpotato do not store as well after harvesting as white-fleshed.	3.13	1.06	1	5	3.20	1.05	1	5
AP12	You can't consume too much orange-fleshed sweetpotato because they are very sweet	3.57	1.04	1	5	3.64	0.97	1	5
AP13	Orange-fleshed sweetpotato mature earlier than the others	2.48	1.22	1	5	2.43	1.18	1	5
AP14	Orange-fleshed sweetpotato are not loved by children	3.82	1.10	1	5	3.94	0.95	1	5
AP15	Orange-fleshed sweetpotato are not tolerant to diseases	3.40	1.13	1	5	3.34	1.08	1	5

Note: Underlying scale: 1 = strongly agree and 5 = strongly disagree; N=363

Table 4: Results of the rotated factor matrix used to evaluate underlying latent attitude construct

Code	Statement	Factor 1	
		OFSP attribute preferences	
		Women	Men
AP02	<i>Sweetpotato leaves are good for human beings to consume</i>		
AP03	<i>Sweetpotato is a food for women and children only</i>		
AP04	Orange-fleshed sweetpotato are healthier than white-fleshed	0.5435	0.5104
AP05	<i>Sweetpotato is the most reliable food crop for our family during times of food shortage</i>		
AP06	<i>Even when we have lots of maize/cassava/rice / beans/Irish potato(or use major food crop in area) to eat, we still like to have sweetpotato in our diet</i>		
AP07	<i>You can't grow sweetpotato and be considered a man</i>		
AP08	<i>You can't eat too much sweetpotato because you will get stomach problems</i>		
AP09	Orange-fleshed sweetpotato do not taste as good as white-fleshed	0.5078	0.5098
AP10	Orange-fleshed sweetpotato yield more than white-fleshed	0.5347	0.4599
AP11	Orange-fleshed sweetpotato do not store as well after harvesting as white-fleshed	0.5558	0.5589
AP12	You can't consume too much orange-fleshed sweetpotato because they are very sweet	0.5709	0.6293
AP13	<i>Orange-fleshed sweetpotato mature earlier than the others</i>		
AP14	Orange-fleshed sweetpotato are not loved by children	0.5916	0.5365
AP15	Orange-fleshed sweetpotato are not tolerant to diseases	0.5785	0.5628
Cronbach's alpha		0.7574	0.7342
Bartlett's p-value		0.0000	0.0000
Overall KMO value		0.806	0.794

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