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Preference Certainty and Consistency in Discrete Choice Experiments: A Case Analysis of Sweet Potato Farming in Western Kenya

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Abstract **– The aim of this study was to evaluate farmers' preference certainty and consistency in their choice decisions for sweet potato varietal traits in Kenya. This was achieved through the discrete choice experiment (DCE) approach where farmers' preference certainty and consistency was analyzed for six select varietal traits that include: yield level, tolerance to pests and diseases, sweetness of the flesh, colour of the flesh, maturity period and price change. Study results from primary data collection of 400 randomly selected farmers from Western Kenya show that farmers were considerably certain about their preferences with an average certainty score of 7.0 on a scale of 0-10. They were also consistent in their choice behavior since they chose the same option in the second occasion as they did in the first occasion in 65.9% of the cases. The implication is that sweet potatoes famers in the study area were well aware of their preferences for different varietal traits and that breeding programs in the country could well work with the farmers in advancing sweet potato varieties with better traits for improved livelihoods.**

Keywords **– Preference Certainty, Consistency, Discrete Choice Experiment, Sweet Potato Variety.**

I. INTRODUCTION

Discrete choice experiments (DCEs) have become a popular approach in providing guidance to policy makers regarding the value of environmental goods and services (e.g. Birol and Koundouri, 2008; Bennett, 2011; Colombo et al., 2015). In a typical DCE, respondents are asked to choose the preferred alternative from a choice set, which typically contains between two and five alternatives (e.g. Colombo et al., 2015; Dellaert et al., 2007). A major attraction of DCEs among researchers has been that they have the ability to place respondents into situations in which they must make trade-offs among multiple attributes of alternatives (e.g. Boxall et al., 2009; Colombo and Glenk, 2013; Day and Pinto 2010).

While the attraction has the potential to yield greater information than other non-market valuation approaches such as contingent valuation, it comes at a cost since it requires considerable cognitive effort by respondents in making their choices (e.g. Boxall et al., 2009; Fiebig et al., 2010; Swait and Adamowicz, 2001a). The dilemma thus encountered in DCEs is the trade-off that researchers must make between thorough descriptions of the choice alternatives and the ability of respondents to understand and make certain and consistent choices on the attributes (e.g. DeShazo and Fermo, 2002; Cameron and DeShazo, 2011) associated with the agricultural improvements.

One of the important assumptions underlying DCEs is that respondents are certain about their indifference curves and can perfectly reveal their preferences by choosing an alternative from a variety of alternatives through a trade-off process (e.g. Brown et al., 2008; Hanemann, 1984). However, this assumption that does not seems to hold in practice because past empirical studies have now shown that respondents may not after all be certain in their choice behaviour (e.g. Alberini et al., 2003; Brouwer et al., 2010). One main reason for this is

that DCEs are often abstract and involve stating monetary values in regard to hypothetical product changes. Thus, based on the existing preferences, respondents are assumed to be able to compare, rank and trade-off the benefits of different product changes against the costs involved in terms of personal money income they are willing to sacrifice (e.g. Akter et al., 2008; Bateman et al., 2008; Brouwer et al., 2010).

Numerous methods have so far been developed to capture preference certainty among survey respondents (e.g. Morrison et al., 1996; Mitchell and Carson, 1989; Brown et al., 2008), and they include the use of polychotomous choices (where preference certainty is captured through ordinal measures such as 'Don't Know/ Not Sure' or 'Definitely Yes, Probably Yes, Unsure, Probably No, Definitely No'), numerical certainty ratings (where respondents are asked to rate their preference certainty on a scale of 0 to 10) as well as a post-decisional confidence rating, which have been treated by recoding or incorporating uncertainty measures in the likelihood function (e.g. Ready et al., 1995; Li and Mattson, 1995; Champ et al., 1997). In addition, ordered and mixed logit formulations have also been developed to capture response certainty in the choice behaviour of the respondents (e.g. Whelan and Tapley, 2006; Whelan et al., 2008).

Of much interest is that subsequent incorporation of preference certainty information into the analysis of choice data has yielded inconsistent outcomes regarding its effect on model fit, efficiency and credibility of the derived survey outcomes. Lundhede et al. (2009) focusing on the evaluation of different approaches using respondents' stated choice certainty to improve model estimation note that effects on model fit, efficiency and credibility of the derived survey outcomes depend on the way a researcher handles respondents' stated choice certainty and what is assumed to be the reasons for the stated certainty. Samnaliev et al. (2006) summarize these reasons by stating that i) certainty levels indicated by respondents may reflect their attempt to appear consistent in answers ii) certainty levels may be susceptible to protesting and strategic behaviour such as respondents exaggerating certainty iii) respondents may use stated uncertainty to scale down their stated WTP and iv) though rational, respondents may assess the value of a product change with some degree of uncertainty and thus give responses that may be subject to error, which translates into a probability that respondents do not choose the utility maximizing alternative.

The undeniable implication by Samnaliev et al. (2006) is that response choice certainty, which can be tested empirically, is still a contested issue and prevalent (e.g. Akter et al., 2008; Brouwer et al 2010; Hensher et al., 2011) in stated preferences. Moreover, Hensher et al. (2011) note that little is known about the influence of response choice certainty in DCEs whose further understanding can provide a foundation for refined economic models for analyzing choice behaviour. As such, this study therefore investigated the role of preference certainty in the choice behavior of the farmers towards sweet potato varietal traits in western Kenya. The analysis involved assessing the relationship between respondents' responses to preference certainty questions as demarcated on a numerical scale of 0-10 points of certainty (e.g. Hensher et al., 2011, 2012; Beck et al., 2011). An attempt was also be made to control for exogenous effects such as farm, farmer and attitudinal characteristics of individual respondents, which may have a bearing on the degree of certainty placed on stated choices.

Another dilemma encountered in DCEs concerns the ability of respondents to understand and make consistent choices on the attributes presented (e.g. DeShazo and Fermo, 2002; Cameron and DeShazo, 2011). Notably, the consistency with which individuals make their choices has been shown to have important consequences for

survey outcomes derived in DCEs since whenever individuals fail to make the same choices in otherwise identical choice tasks, the credibility of the policy outcomes emanating from DCE surveys is lowered (e.g. Salensminde, 2002; Hess et al., 2010). Despite the fact that respondents in DCEs state their choices in hypothetical markets with minimal scope for them to familiarize with the choice attributes they are asked to consider, establishing whether or not individuals are consistent in their choice decisions has received limited attention (e.g. Brouwer et al., 2008; Czajkowski et al., 2014; Liebe et al., 2012; Salensminde, 2001). This has prompted studies to be carried out in which respondents repeat a choice process after some interval and the consistency of the values derived investigated. While the results of these choice consistency analyses have largely been consistent and robust in terms of the survey outcomes, it is not well known whether they are typical of the time aspect and hence, reliable to inform relevant policy narratives.

Apparently, most studies analyzing preference consistency among individuals have focused on the intertemporal approach where outcomes are assumed to be stable and reliable (e.g. Brouwer and Logar, 2014). In practice, this may not be the case since outcomes derived from intertemporal analysis may be prone to significant amounts of variation in the behavioural as well as the socio demographic characteristics of the respondents over the period under consideration. Therefore, this study addressed this issue through a different approach where a choice task in a sequence of 10 choice tasks was repeated and then used assess sequential preference consistency of farmers in their choice for sweet potato varietal traits.

The rest of the paper is structured as follows. Section 2 sets out the theory of the study. Section 3 describes the experimental design. Section 4 presents the model estimation results and interpretation and section 5 concludes.

II. THEORETICAL FOUNDATIONS

Choice certainty among respondents has for a long time been debated by researchers though the focus has varied from time to time. For instance, on the elicitation process, Manski (1995) suggests the use of direct questions to allow respondents to elicit their probabilistic assessment of hypothetical preferences. On the other hand, Bemmaor (1995) argues for a qualitative assessment of choice certainty among respondents involving ordinal measures such as “very certain” “probably not” and “certainly not”. Li and Mattsson (1995) suggest yet another procedure of using a continuous certainty measure (0% to 100%) in the elicitation of respondent certainty especially in contingent valuation choices studies. While Loomis and Ekstrand (1998), Reddy *et al.* (1995) and others suggest the use of qualitative measures for certainty rating elicitation in WTP studies, Hanemann *et al.* (1999) recommend procedures of collecting respondent’s perception of certainty in the form of interval scale rather than in the form of strict numbers.

On the treatment of certainty data in the final analysis, both qualitative and quantitative information on certainty ratings has been included directly or indirectly in the final investigation of the choice data. Some researchers (Champ *et al.*, 1997; Ethier *et al.*, 2000; Champ and Bishop 2001; Lundhede *et al.*, 2009) have argued for the inclusion of elicited certainty ratings into the choice models by creating a threshold of certainty so as to screen out similar response data to the model. Such practice of creating thresholds to screen out similar response data is intended to eliminate choices that have very low certainty. However, Norheim (2001) and Rose et al. (2015) have argued that the practice of scrapping of low-certainty choices in order to remove outliers from

the choice data is counterproductive and leads to loss of data since the low-certainty responses may not necessarily be wrong choices. They observe that the low-certainty choices may be a reflection of respondents' ambivalence to the choice tasks due to task complexity and should therefore not be scrapped off. As Hensher *et al.* (2012) note, the elicited certainty rating on any choice task may be essentially a function of choice task complexity arising the number of alternatives, attributes and their levels in the choice tasks.

About the nature of the final results after the integration of choice certainty in the final analysis, Shaikh *et al.* (2007) report that the accommodation of certainty in a choice model may not only result in better goodness-of-fit of the choice model, but may also introduce some additional variance. Lundhede *et al.* (2009) also finds that the incorporation of the elicited certainty in choice analysis may not necessarily improve the performance of the choice model, but rather provide a structurally stable way of accommodating such additional information into individual preference investigation.

While Beck *et al.* (2013) observe that lack of a proper theoretical background of accommodating the elicited certainty ratings into choice modeling could be the main reason of serious difficulties in explaining the influences of such ratings on individual choices, Dekker *et al.* (2016) find that innovative models such as their own integrated latent variable choice model designed to exploit the elicited certainty ratings into the DCE model estimation process may pose several challenges in the estimation of the choice model with even no prove towards improved model fit or statistical significance of the parameter estimates.

Notably, the present paper however does not explore on how to incorporate the elicited choice certainty into the discrete choice model, but rather on the intuitive way of handling the elicited choice certainty data to yield information that could inform further research on incorporating such certainty data into the DCE models. For the first time, the paper applies a procedure initially used by Chang *et al.* (2007) and Wang and Whittington (2005) to estimate welfare estimates corrected for response uncertainty to analyze the kind of certainty scores generated by the 0-10 point certainty scale and further establish the empirical relationship between choice certainty and consistency. Following Chang *et al.* (2007) and Wang and Whittington (2005), suppose that individual $i's$ choice certainty associated with a given choice task is $C_{i,}$ so that all $C_{i,}$ have a mean value of μ_i and standard variance is $\sigma_{i,}$, then the choice certainty model can be represented as:

$$C_i = \mu_{i,} + \varepsilon_i \tag{5}$$

where ε_i is a random term with a mean of zero. Assuming that individual i well knows her preferences and the choice certainty over any given choice task c, then μ_i and σ_i can be derived and estimated for each individual i and thereafter, used to construct linear models to analyze relevant explanatory factors for the elicited certainty scores. A choice consistent variable can also be added to the model to assess the statistical relationship with choice certainty. A functional form that can be used to relate μ_i and σ_i with relevant explanatory factors and the choice consistent variable is:

$$\mu_i = \beta_0 + x_i'\beta + z\delta + \varepsilon_1 \tag{6}$$

$$\sigma_i = \alpha_0 + w_i'\alpha + z\delta + \varepsilon_2 \tag{7}$$

where x_i' and w_i' are personal specific variables, z is the choice consistent variable, β, α and δ are coefficients to be estimated while ε_1 and ε_2 are random errors.

III. EXPERIMENTAL DESIGN

In CEs, respondents are presented with alternative descriptions of policy interventions, differentiated by different combinations of attribute levels. Respondents are then asked to choose their preferred alternative. For each choice made, the alternative selected is assumed to yield a higher level of satisfaction than that rejected. This enables the probability of an alternative being chosen to be modelled in terms of the attribute levels used to describe the policy intervention. In this paper, respondents were presented a series of variety traits that include: yield level, tolerance to pests and diseases, sweetness of the flesh, colour of the flesh, maturity period and price. Respondents were asked to choose their most preferred varietal alternative. Based on expert interviews in an open-ended pretest ($N = 50$), different levels for the selected varietal traits were selected as shown in Table 1, below.

Table 1. Descriptions and levels of the chosen attributes.

Attribute	Description	Levels	Coding
Yield	The amount of sweet potato out per hectare	Level 1: 6 tons/hactre Level 2: 10 tons/hactre Level 3: 14 tons/hactre	Actual values
Tolerance	Forbearance to common crop pests and diseases	Level 1: High Level 2: Medium Level 3: Low	Effect coding
Sweetness	Taste of the sweet potato flesh.	Level 1: Good Level 2: Average Level 3: Bad	Effect coding
Colour	Colour appearance of the sweet potato flesh.	Level 1: Orange Level 2: Yellow Level 3: White	Effect coding
Maturity	Period sweet potato takes to mature.	Level 1: Upto 3 months Level 2: Upto 5 months Level 3: Upto 7 months	Actual values
Price	Change in price per unit of output.	Level 1: 100 Level 2: 200 Level 3: 300	Actual values

There were also different alternative varietal scenarios created by combining these six variables based on their different attribute levels. Because respondents cannot be shown all different choice options, the number of possible combinations was reduced to 10 choice sets of 10 choice tasks each based on an orthogonal fractional factorial design generated in the statistical software *Ngene*, enabling the estimation of main effects and two-way interactions. Each respondent was randomly shown one of these 10 choice sets of 10 choice cards. Each choice card shows two hypothetical choice alternatives describing a future policy scenario along with the option to ch-

-oose none of the two.

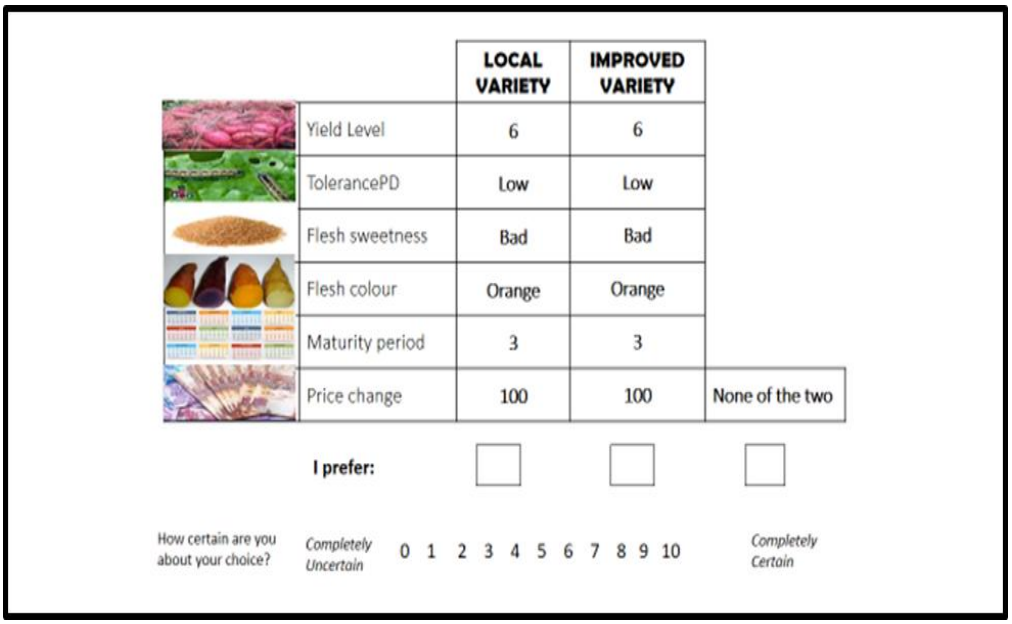

Fig. 1. Example choice card.

Inclusion of this latter 'status quo' alternative is instrumental to be able to estimate welfare measures that are consistent with demand theory (Bateman et al., 2003). It was emphasized that respondents would not have to pay anything extra if they choose the opt-out. An example of a choice card is presented in Figure 1.

The design of the choice experiment main comprised three sections. The first section was intended to measure respondents' general knowledge on sweet potato varietal traits so as to familiarize them with the attributes of interest that were being evaluated. The second section contained questions for DCE analysis that were designed to elicit respondents' WTP for sweet potato varietal traits by estimating trade-offs between price and the other attributes. In this case, common photographs of the attributes were also inserted in the DCE cards to enhance respondents' understanding regarding the attributes. The final part elicited socio-demographic information of the respondents such as age, gender, education and income. The choice experiment instrument was first pre-tested and subsequently implemented between October-December 2019 through 400 in-person interviews in Western Kenya. The response rate was 100%, which is not unusual for this kind of stated preference research in a developing country (Whittington, 1998). A predetermined random sampling plan was used to obtain respondents for the survey. Trained local enumerators were also used for the interviews to ensure choice scenarios were presented to respondents in a more informative way. The enumerators had instructions to limit all explanations to facts so as to minimize the introduction of any interviewer bias. Moreover, respondents were given adequate time to understand and answer each question so as to enhance the validity of responses obtained. The results are presented in the following section.

IV. Results and Discussions

4.1. *Descriptive Results*

Descriptive results of the socio-demographic and farm characteristics of the survey sample are presented in Table 2. As shown, the mean age of the respondents was 45 years with men accounting for the largest share

(78%) of the respondents. Most respondents (93%) had primary and post-primary level of education with only 11% and 14% of the respondents having had access to farm credit and agricultural extension services, respectively.

Table 2. Socio-demographic and farm characteristics of the survey sample.

Variable	Mean/Proportion	Std Error	Min	Max
Age (years)	45	13.31	20	85
Gender (1 = male)	0.78	0.41	0	1
Education (1 = educated)	0.93	0.25	0	1
Access to farm credit (1 = access)	0.11	0.31	0	1
Access to agricultural extension (1 = access)	0.14	0.35	0	1
Membership to farm organizations (1 = member)	0.16	0.37	0	1
Sweet potato variety grown (1 = improved)	0.62	0.48	0	1
Frequency of growing sweet potatoes (1 = more than once)	0.36	0.48	0	1
Sweet potato use (1 = commercial purposes)	0.95	0.22	0	1
Source of sweet potato vines (1 = own farm)	0.35	0.77	0	1
Quantity of sweet potato harvest (tonnes)	1.91	15.23	0	300
Sweet potato income (KES)	11,702	2,114	0	180,000
Distance to reliable input/output market (Kms)	3.07	0.71	0.1	7

On average, the distance to a reliable input/output market centre was about 3kms with membership to farm organizations having a share of 16% of the interviewed farmers. Land holdings were, on average, 0.37 acres with household heads having a farming experience of about the study also found that 62% of the respondents were growing improved sweet potatoes varieties with 36% of the respondents saying they grew sweet potatoes more than once in a year.

Moreover, the study also found that 95% of the interviewed farmers produced sweet potatoes for commercial purposes. As to the source of the sweet potato vines, the study found that 35% of the farmers sourced vines from their own farms. On average, sweet potato production was about 1.91 tonnes that fetched an average income of about KES 11,702.

4.2. *Econometric Results*

4.2.1. *Preference Certainty*

As mentioned, respondents were asked to rate their level of certainty regarding the choices they made in the DCE for the different varietal traits on a scale from 0 to 10. The aim was to capture self-reported individual choice certainties that could be used to further inform the choice model results. The study findings indicate that respondents were considerably certain about the choices they made, with an average certainty score of 7.0 and a standard deviation of 1.38. Table 3 displays the distribution of the certainty scores for the data set.

Table 3. Certainty distribution of the respondents in the Sample.

Certainty	Frequency	Percentage
0	0	0
1	3	0.7
2	8	1.9
3	13	3.3
4	13	3.2
5	19	4.9
6	33	8.2
7	58	14.6
8	91	22.7
9	79	19.8
10	83	20.9
Total	400	100

Explanatory notes: N = 400 respondents.

In addition, a least squares regression model was estimated as in Chang *et al.* (2007) and Wang and Whittington (2005) to explore possible drivers underlying the observed variation in self-reported choice certainty. The regression results are presented in Table 4, where the response variable is the average self-reported choice certainty across all 10 choice tasks. As shown in the table, older farmers were more likely to be certain about their preferences than younger farmers and this could be attributed to the cumulative experience in sweet potato farming that older farmers had over the younger ones. In addition, female respondents were found to have a lower reported choice certainty compared to their male counterparts. A possible reason might be that younger female respondents are less involved in decision making while making farm choices of the sweet potato variety to be grown, and therefore experienced higher choice uncertainty. The regression results also show that choice certainty among sweet potato farmers also increased with having gone to school, access to farm credit and extension services, membership to farm organizations, sweet potato variety grown, frequency of growing sweet potato crop in an year, sweet potatoes use, sweet potato yields, and income derived from sweet potato sales. Nonetheless, choice certainty was found to decline with sources of sweet potato vines and distance to a reliable input-output market. The consistency variable was also positive and significant meaning that individuals consistent in their choice decisions for sweet potato varietal traits were more likely certain about their preferences as opposed to individuals with consistent choice behaviour.

Table 4. Least squares regression results on the determinants of reported preference certainty.

Variable Description	Coefficient	Standard Error
Age (years)	0.009*	0.001
Gender (1 = Male)	0.011	0.030
Education (1 = educated)	0.157**	0.049

Variable Description	Coefficient	Standard Error
Access to farm credit (1 = access)	0.709**	0.040
Access to farm extension services (1 = access)	0.224**	0.039
Membership to farm organizations (1 = member)	0.016	0.036
Sweet potato variety grown (1 = improved)	0.369**	0.025
Frequency of growing sweet potatoes (1 = more than once)	0.233*	0.025
Sweet potato use (1 = commercial purposes)	0.521*	0.061
Source of sweet potato vines (1 = own farm)	-0.066**	0.016
Sweet potato yields (tonnes)	0.003*	0.001
Income from sale of sweet potatoes (KES)	0.000*	0.000
Distance to a reliable input/output market (Kms)	-0.060**	0.017
Consistency (1 = consistent)	0.047*	0.025
Constant	7.695**	0.066
Model Summary Statistics		
F(14, 385)	114.55	
Prob > F	0.0000	
Adjusted R^2	0.1170	
Number of observations	4000	

Explanatory notes: Response variable: reported preference certainty; * p < 0.1; ** p < 0.05; *** p < 0.01.

4.2.2. *Preference Consistency*

Preference consistency was explored in the study by asking respondents to answer the same choice card on two occasions. In a given choice set, the first-choice card was repeated either as 6th, 7th, 8th, 9th or 10th card. Preference consistency across the two choice occasions was assessed by directly comparing the choices made by each individual on both choice occasions. The study found that respondents chose the same option in the second occasion as they did in the first occasion in 65.9% of the cases.

Table 6. Sample shares (%) consistently choosing the same varietal alternative.

Choice Task Where the Same First Choice Card is Shown Again	Frequency	Percent
1 – 6	61	15.3
1 – 7	56	14.0
1 – 8	53	13.3
1 – 9	48	12.0
1 – 10	45	11.3

Choice Task Where the Same First Choice Card is Shown Again	Frequency	Percent
Total	263	65.9%

The pattern of the repeated choices made in the two choice occasions is summarized in Table 6. About 15.3% of the respondents made the same choice when the 1st card was repeated as the 6th choice card in the sequence of 10 choice cards. This share slightly but gradually decreased when the same first choice card is repeated further down the choice sequence to 11.3% consistent choices when the 1st card is repeated in the 10th and last choice task. Moreover, in order to identify what might drive consistent choice behaviour among respondents, possible explanatory factors influencing the probability of consistent choices were regressed on the binary choice consistency indicator (yes or no) in a logit model. Choice consistency was given the value 1 if the respondent made the same choice in both choice occasions and zero otherwise.

The regression results are presented in Table 7.

Table 7. Logit model results explaining consistent choice behaviour of individual preferences.

Variable Description	Coefficient	Standard Error
Age (years)	0.003*	0.002
Gender (1=Male)	0.345*	0.052
Education (1=educated)	0.272**	0.082
Access to farm credit (1=access)	0.174*	0.067
Access to farm extension services (1=access)	0.407*	0.064
Membership to farm organizations (1=member)	0.368**	0.063
Sweet potato variety grown (1=improved)	0.205*	0.043
Frequency of growing sweet potatoes (1=more than once)	0.198*	0.042
Sweet potato use (1=commercial purposes)	0.267*	0.104
Source of sweet potato vines (1= own farm)	-0.118**	0.028
Sweet potato yields (tonnes)	0.076*	0.012
Income from sale of sweet potatoes (KES)	0.000*	0.000
Distance to a reliable input/output market (Kms)	-0.524*	0.031
Choice task of repeated card (6- 10)	-0.239*	0.015
Constant	3.932**	0.169
Model Summary Statistics		
Log likelihood	-7237.31	
LR chi-square (14 d.o.f.)	949.70	
Prob > chi square	0.0000	
McFadden Pseudo R^2	0.0616	

Variable Description	Coefficient	Standard Error
Number of observations	4000	

Explanatory notes: Response variable: consistent choice = 1, otherwise = 0; * p < 0.1; ** p < 0.05; *** p< 0.01.

The results in Table 7 reveal that older farmers were more likely to be consistent in their choices than younger respondents. Male respondents were also more likely to be consistent in their choices than female respondents. Consistent choice behaviour among individual farmers was also found in the study to increase with access to farm credit and agricultural extension services, membership to farm organizations, sweet potato variety grown, frequency with which sweet potato crop was grown in an year, sweet potatoes use, sweet potato yields, and income from sale of sweet potato. Preference consistency was nevertheless found to decline with sources of sweet potato vines and distance to reliable input-output markets. The choice task of repeated card variable was negative and significant confirming that consistent choice behaviour of individual respondents declined as the repeated choice card was located further away from the 1st choice card.

V. CONCLUSIONS

The aim of this study was to contribute to our better understanding of farmers' preference certainty and consistency for sweet potato varietal traits in Kenya. This was achieved through the discrete choice experiment (DCE) approach where farmers' preference certainty and consistency was evaluated for six selected varietal traits that include: yield level, tolerance to pests and diseases, sweetness of the flesh, colour of the flesh, maturity period and price. On preference certainty, respondents were asked to rate their level of certainty regarding the choices they made for the different varietal traits on a scale from 0 to 10. As regards preference consistency, respondents were asked to answer the same choice card on two occasions where the first choice card was repeated either as 6th, 7th, 8th, 9th or 10th card in the choice sequence and thereafter, preference consistency across the two choice occasions compared.

The study findings indicate that respondents were considerably certain about the choices they made, with an average certainty score of 7.0 and a standard deviation of 1.38. Moreover, respondents were also consistent in their choices in the sense that they chose the same option in the second occasion as they did in the first occasion in 65.9% of the cases. While choice certainty and consistency was found to be an increasing function of factors such as age, gender, education, access to farm credit, extension services membership to farm organizations, sweet potato variety grown, frequency with which sweet potato crop was grown in an year, sweet potatoes use, sweet potato yields, and income from sale of sweet potato, it also declined with sources of sweet potato vines and distance to reliable input-output markets. The overall policy implication is that sweet potatoes famers in the study area are well aware of their preferences for different varietal traits and that breeding programs in the country could well work with the farmers in advancing sweet potato varieties with better traits for improved livelihoods and food security situation in the country.

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