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**Preferences and Selection  
Criteria of Sweet Potato  
Varieties in Urban Areas  
of the Lake Zone  
of Tanzania**

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## Executive Summary

Sweet potato has enormous potential as a food security crop in the Tanzanian food system, especially in the Lake Zone. Despite its importance in food systems, a review of information so far available on consumer preferences of sweet potato varieties, highlighted the lack of knowledge on the preferences of urban consumers where sweet potato has recently gained market potential. Therefore a study by means of informal survey techniques was initiated in order to gain an insight on the preferences of sweet potato varieties by urban consumers. This information is very important for guiding researchers in developing acceptable varieties for urban areas.

The survey was conducted in September/October 1996 in three districts: Mwanza, Meatu and Ukerewe all of which are known to be important for sweet potato production and marketing. Semi-formal interviews with a checklist were used. A total of 58 sweet potato consuming households and 35 sweet potato traders (primarily retailers) were interviewed. Interviewees were selected on the basis that they were known to be sweet potato consumers or traders, the conclusions from this survey cannot therefore be taken as an indication of the preferences of the population as a whole. Households spent on average 200-1000 Tsh/week on sweet potato. The households at Ukerewe tended to consumer sweet potato more frequently (>50% consumed every day) than the other two districts, which is probably an indication of the behaviour of the whole population.

The main objective of the survey reported here was to identify the characteristics that urban consumers consider important in sweet potato varieties for fresh consumption and also for processing. One way used to obtain this information was to determine which specific varieties consumers/traders preferred and why.

The total number of varieties mentioned by name was high, with over 40 varieties mentioned for the three districts. Although both consumers and traders expressed preferences for specific varieties, given the high number of varieties and the relatively small scale of this survey rankings of cultivars must be tentative. However certain varieties were notable. For example the most popular variety identified by consumers in both Mwanza and Meatu was Sinia and this variety ranked fourth in Ukerewe. On the other hand, Mzondwa was the most popular variety among consumers in Ukerewe, but was not preferred in either other district. The subjective nature of consumer preferences is underlined by the fact that Mzondwa was identified as a good variety by 14 households in Ukerewe, but as a bad variety by 5 households in Ukerewe and 3 households in Mwanza.

When comparing varietal preferences of traders with those of consumers there was reasonable agreement, but with some notable exception in Mwanza and Meatu. For example, Polista is the most popular variety among traders in Mwanza, but was not mentioned by consumers interviewed in any district. This is probably an example of a new variety that consumers have yet to learn to recognise. It was notable that agreement between consumers and traders was strongest in Ukerewe, which could be a consequence of the fact that this is a sweet potato producing area.

Most traders (30 out of 35) did not consider that consumer preferences resulted in price differentials between varieties, but this has not been verified by market observations.



Consumers who also grew their own sweet potatoes were asked which varieties they preferred to grow. The ranking of varieties in this case was similar but not identical to the varieties preferred for buying.

With respect to quality criteria considered most important for fresh sweet potato roots a very consistent picture emerged. Both consumers and traders considered that high dry matter content (also expressed as starchy, or floury) and good taste were the most important criteria. This was followed by cooking quality (referring to the time needed for cooking) and the colour of the flesh and skin. Other criteria mentioned were low fibre content, good storability after purchase and root size.

Both consumers and traders store sweet potato roots. At the household level most consumer would not store beyond 3 days, while in the market it was relatively common to store up to 5 days. 15 out of the 58 consumers interviewed said that they practised longer term pit storage. Consumers were divided as to whether some varieties stored better than others, but certain varieties were highlighted as storing well, including Sinia, Simama, Ipembe, Koloboi, Chilile and Mzondwa. The main forms of deterioration mentioned during storage were rotting and water loss, with no mention of sprouting or changes in taste/texture. Colour changes were noted in Ukerewe during storage.

Although none of consumers interviewed in Ukerewe used processed sweet potato, processing was carried out to some extent in Mwanza and was common in Meatu. Two types of product, *Michembe* (sliced and sun-dried) and *Matobolwa* (boiled, sliced and dried) were used. Consumers obtained their processed products either by processing at home or buying from the market in roughly equal proportions. There were distinct cultivar preferences for processing, especially in Meatu, and these did not correspond to the varieties that are preferred for fresh consumption. Most households that used processed products would store them, usually in sacks. Only consumers in Meatu were used to storing for long periods. In this case a storage period of 13-24 months was usually possible. Insect attack was said to be the most important form of loss, and various control methods were described.

The findings of the survey led to the following recommendations:

- I. During breeding and testing of sweet potato varieties, emphasis should be placed on selecting those that have the quality criteria highlighted by consumers and traders (see (2) above), especially those which are starchy/mealy and have good taste. It is assumed that starchy/mealy correlates with high dry matter content, but this has yet to be verified. Taste is a subjective quality, and the relationship between "good taste" as perceived by consumers and measurable characteristics is unknown and should be investigated. The most practical way of assessing these characteristics for new varieties is probably to use trained taste panels on-station related to consumer tests off-station.
- II. Storability is one of the qualities identified as being a desirable characteristic, although not as high priority as quality. It is notable that most consumers and traders do not expect to store sweet potatoes for more than a few days. An extension of shelf-life would greatly increase the potential for transporting and trading this commodity. For future interventions some in-depth investigations should be carried out concentrating on the identification of

root qualities associated with extended shelf-life, to enable easy selection of better storing varieties.

- III. The main losses experienced during storage are rotting and water loss. Improvement of storage methods could probably make a big improvement in shelf-life. Given the impracticality of refrigeration in Tanzania the main environmental factor that can be manipulated is humidity. Investigations to determine the optimum relative humidity of storage needed for moisture retention but low rotting should be carried out.
- IV. The increased utilization of processed products in urban areas could maximize the potential value of sweet potato by minimizing the losses incurred during storage of fresh roots. However, processed sweet potato is still not commonly consumed in urban areas. This may be due partly to lack of knowledge of processed products, but may also be due to low quality. There is a need to obtain more information about the quality criteria associated with good processed products, including the characteristics of a good processing variety.
- V. No information has yet been collected to quantify the varieties presently sold. This would be a very useful baseline study, and essential if impact assessments are to be carried out in future when the National Programme starts to release new varieties.



## 1. INTRODUCTION

Sweet potato is considered as a household food security crop by much of the population of Lake Zone in Tanzania. It is marketed and consumed in both urban and rural areas. Its production in a large proportion of the zone is seasonal. Although there is some production throughout the year, there is a peak season lasting from May to July and a low season lasting from October to April. This variation in production is reflected in market prices for sweet potato both in rural and urban markets. These fluctuations in price and the availability of other crops also influence the rate of consumption. As urban populations grow, sweet potato is one of the staple foods which is becoming increasingly important in urban food systems.

Despite its importance in food systems, there has been little information collected pertaining to the consumer preferences for sweet potato varieties at the urban level in Tanzania (Kapinga *et al.* 1997). This has arisen because in the past sweet potato was produced primarily for consumption rather than marketing in rural areas. The utilization of sweet potato in urban areas was very much limited. The level of consumption may have been underestimated, however, as people would not usually admit to eating a low status food that could reflect their low income status. Another factor contributing to the low consumption in urban areas might be the limited options for the utilization of sweet potato roots. Hence sweet potato products do not compete well with the diversity of products from more valued crops.

With the increase in urban populations, however, there has been a tremendous positive change in attitude towards sweet potato, helped by the diversity of culture and income status of the urban dwellers.

At urban levels, most consumers obtain sweet potato roots from the markets. Some consumers supplement these by growing sweet potato themselves. It has been found that not all varieties are acceptable to consumers due to various characteristics such as low dry matter and high fibre content. This has underlined the importance of considering consumer preferences when breeding sweet potato varieties for increased yield.

Baseline studies conducted throughout the country by researchers from the National Co-ordination Unit for Farming Systems Research (FSR-NCU data file, 1996) established the main criteria set forward by sweet potato growers and consumers at farm level to enable the development and selection of good varieties. Given the lack of information at urban levels, an initial study has been conducted in urban areas of the Lake zone (the major producing zone in the country) to complement the existing information at the rural level.

The following objectives were set for the survey:

- To assess the demand for sweet potato in both households and markets in urban areas
- To determine the consumer preferences for specific sweet potato varieties in urban areas.
- To assess the characteristics preferred for sweet potato varieties in urban areas
- To assess the forms of utilisation of sweet potato in urban areas.

This survey has been conducted as part of a project focused towards improvement of sweet potato characteristics through cultivar selection. The information obtained will be used as a base for directing breeding programs in their attempts to identify the most appropriate varieties for consumers in urban areas. It will complement the information already collected at the farm level and will enable the Root and Tuber Programme in Lake Zone to develop acceptable varieties for consumers in both rural and urban areas.

#### **Acknowledgements:**

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## 2. METHODOLOGY

### 2.1. Areas surveyed, interviewees and selection criteria

Surveys were conducted between September - October, 1996 in 3 districts of the Lake zone (Meatu, Mwanza and Ukerewe).

A list of the urban areas surveyed and the number of respondents per district is presented in Table 1.

Only areas where sweet potato was considered an important commodity were selected. The selection criteria for the areas surveyed were as follows:

- The importance of sweet potato relative to other food staples
- The contribution of sweet potato to household food security and household income.
- The growing demand of sweet potato in sustaining household earnings through the sale of roots.
- The availability of fresh roots and processed sweet potato products in the markets.
- The level of diversification of sweet potato utilisation.

Within the chosen areas a total of 35 market agents and 58 urban households were interviewed.

Households were selected on the advice of local leaders and extension workers. Only households known to consume sweet potato were interviewed. Information about the size and income group of households is given in Table 1. Income group was assessed on the basis of the appearance and contents of the house. For example a household with a "good-looking" house and electronic assets was considered to be high income.

Of the 58 urban households interviewed 37 were considered to belong to the low income group, 20 to medium income and a only 1 from Ukerewe district was considered to belong to the high income group (Table 1a). The uneven spread of interviewees across income groups was partly a consequence of the effect of income on sweet potato consumption. Discussion with key informants (extensionists and urban leaders) indicated that the consumption of sweet potato varied with income. Low income groups consumed sweet potato more frequently than other groups. As the income status of individual households increased there is a tendency to decrease the rate of consumption of sweet potato.

The number of persons per household ranged from 2 to more than 14 as indicated in Table 1a.

A total of 35 traders were interviewed from the three districts. Table 1b indicates which markets they came from. The markets where they worked were categorised subjectively as small, medium and large. In Meatu, one of the markets was classified as non-permanent, as a temporary market place existed for market days only. The traders were primarily retailers. 26 out of 35 considered themselves to be exclusively retailers, while a further 6 sold sweet potato both retail and wholesale. 22 of the traders dealt with sweet potato alone, while the remaining 13 also sold other commodities.

**Table 1a: Households interviewed in Mwanza, Meatu and Ukerewe districts, categorised by size of household and income group.**

Mwanza			
Locations	Igogo, Nyegezi, Mkuyuni		
	No. households interviewed in each income group		
Size of Household	Low	Medium	High
2-3	1	1	
4-5	1	3	
6-8	4	1	
9-14	2	5	
>14			
<b>TOTAL</b>	<b>8</b>	<b>10</b>	
Meatu			
Locations	Mwanhuzi town		
	No. households interviewed in each income group		
Size of Household	Low	Medium	High
2-3	3		
4-5	7	1	
6-8	3	2	
9-14	2	1	
>14	1		
<b>TOTAL</b>	<b>16</b>	<b>4</b>	
Ukerewe			
Locations	Nakatunguru		
	No. households interviewed in each income group		
Size of Household	Low	Medium	High
1	1		
2-3	4		1
4-5	2	2	
6-8	3	3	
9-14	3	1	
>14			
<b>TOTAL</b>	<b>13</b>	<b>6</b>	<b>1</b>
	Total no. households interviewed in each income group		
	Low	Medium	High
	37	20	1

*Income groups were assessed subjectively by observation of the house and contents.*

**Table 1b: Markets visited and traders interviewed**

Market	Market size	No. Traders interviewed by category		
		Retailers	Wholesalers	Retailer /Wholesalers
<b>MWANZA</b>				
Mwaloni	Big			1
Kirumba	Big		1	2
Mwaloni/Kirumba*		1	1	
Songoro	Small	4		
Central	Big	4		
Kirumba Sokoni	Medium	2		
<b>TOTAL</b>		<b>11</b>	<b>2</b>	<b>3</b>
<b>MEATU</b>				
Bukundi Permanent	Medium	4		
Market day only	Non-permanent	2	2	3
<b>TOTAL</b>		<b>6</b>	<b>2</b>	<b>3</b>
<b>UKEREWE</b>				
Nakatunguri	Small	4		
Nansio	Medium	4		
<b>TOTAL</b>		<b>8</b>		

*Market size was a subjective assessment by the interviewers.*

*\* Retailer working in both markets.*

## 2.2 Data collection

The study made use of checklists designed to cover both urban households and market agents (Annex 1). These were adapted from the cassava related studies carried out in urban areas by the Collaborative Study of Cassava in Africa (COSCA) and adjusted accordingly to suit the area of study. The COSCA reference manuals provided a useful guide for the collection of this information (COSCA reference manuals - COSCA URBAN HOUSEHOLDS AND MARKET AGENTS QUESTIONNAIRES).

During the surveys, the information collected was considered under two categories. Urban households (consumers) and market agents (traders).

The information collected from urban households included the following:

- ⇒ sweet potato consumption patterns
- ⇒ the quantity and frequency of purchase of sweet potato



- ⇒ acceptance and rejection of specific sweet potato varieties
- ⇒ utilization practices for sweet potato roots
- ⇒ post-harvest handling of sweet potato
- ⇒ sweet potato cultivation and the varieties commonly grown
- ⇒ marketing of sweet potato

For market agents the information collected included:

- ⇒ the nature of markets and categories of traders
- ⇒ marketing of sweet potato
- ⇒ storage after purchase
- ⇒ varietal preferences.

### 3. FINDINGS

#### 3.1 URBAN HOUSEHOLDS (CONSUMERS)

##### 3.1.1 Sweet potato consumption

Table 2 shows the frequency at which the households included in the survey consume sweet potato. Only households that consume sweet potato were included in the survey, so information was not obtained about consumption rates of the overall population. However, It is noticeable that the frequency was higher in Ukerewe district where 55% of the interviewed group consumed sweet potato every day, whereas in other districts, the frequency of sweet potato consumption ranged from 5 times to 2 times per week. It is assumed that in Ukerewe district individuals can afford to consume sweet potato almost every day due to a regular supply of sweet potato from different parts of the island.

Discussions with individuals from all regions indicated that the frequency of consumption varied with availability of sweet potato in the markets. At high peak seasons, more people consumed sweet potato than in low seasons. Also, during the fasting month for Moslems (Ramadani), sweet potato is consumed even more frequently, usually as part of mixed dishes.

**Table 2. Frequency of Sweet potato consumption by households in urban areas of Mwanza, Meatu and Ukerewe districts**

Frequency of sweet potato consumption per household	Number of households			
	Mwanza	Meatu	Ukerewe	Total
once/day	4	3	11	18
3-5 times/week	7	7	3	17
1-2 times/week	7	7	6	20
< 1 time/week	0	3	0	3
<b>Total</b>	<b>18</b>	<b>20</b>	<b>20</b>	<b>58</b>

### 3.1.2 Purchase of sweet potato

62% of the households interviewed (36 out of 58) indicated that they were spending between 200/= to 1000/= Tanzanian shillings on the purchase of sweet potato per week (Table 3). 24% of the households (14 out of 58) were spending more than 1000/= per week. The remaining 6 households depended entirely on sweet potato produced in their own fields. Individuals indicated that the estimates of expenditure given were averages, because the price of sweet potato in the market fluctuates depending on the availability; at low peaks the price may be doubled because of low availability. During the important fasting month "Ramadhani" the prices could also be doubled or tripled because of high demand even though the availability is also high.

**Table 3: Estimated expenditure per household per week on fresh sweet potato roots in urban areas of Mwanza, Meatu and Ukerewe districts.**

Amount spent per week (Tshs.)	No. of households			
	Mwanza	Meatu	Ukerewe	Total
Households obtaining all sweet potato from their own fields	2	4	0	6
200-500/=	5	7	5	17
501-1000/=	5	7	7	19
1001-2000/=	1	2	4	7
2001-3000/=	4	0	4	8
> 3000/=	1	0	0	1
Total	18	20	20	58

*The expenditure recorded was estimated by the representative of each household as the average weekly expenditure over the whole year.*

### 3.1.3 Varieties preferred for buying

Interviewees were asked to list the varieties that they preferred to buy in the market and the reasons why they preferred these specific varieties. The results are summarised in Table 4. Data on the preferred characteristics is included only for the varieties mentioned most frequently.



In Mwanza urban the most popular variety was Sinia, mentioned by 10 out of 18 interviewees, followed by Suguti (mentioned by 6 out of 18) and Simama (mentioned by 4 out of 18).

In Meatu urban, Sinia was again the most popular variety (5 out of 20) followed by Kibuluu (4 out of 20).

For Ukerewe urban, varieties Mzondwa, Bilagala and Chilile were preferred by 14, 8, and 7 out of 20 interviewees respectively.

**Table 4: Sweet potato varieties most preferred for buying by urban consumers and the main criteria considered.**

District	Variety	Frequency (no. households mentioning variety)	Preferred characteristics ( No. of households)				
			Starchy/ floury	Tasty/ sweet*	Good cooking qualities*	Good root flesh colour***	Good storability
Mwanza ( N=18)	Sinia	10	9	8	2	3	5
	Suguti	6	4	4	-	6	-
	Simama	4	4	3	-	2	2
	Chilile	2	1	-	1	1	-
	Mzondwa	2	1	2	-	-	-
	Polista	1	1	1	-	-	-
	<i>Other varieties mentioned (with frequency) were: Jullasi (1), Nyamwisekeleja (1) Kiliona (1) Rangimbili (1), Tulabagenyi (1) Nyantaya (1), Lutambi (1), Mwiyangi, (1), Kasamwa (1) Kinaje (1) Malya (1)</i>						
Meatu ( N=20)	Sinia	5	4	4	-	-	-
	Kibuluu	4	2	3	-	3	-
	Serena	3	1	1	2	-	-
	Ngoshaga-- gaga	3	3	1	-	-	-
	Tulwawima	2	2	2	-	1	-
	Suguti	1	1	1	-	-	-
	<i>Other varieties mentioned (with frequency) were: Nzegamatolo (2), Ipembelyangholongo (2), Sengi(1), Ngoshaalaja (1), Ukerewe (Nyekundu) (1), Kenya (1), Sinia la Nyerere (1), Ndoleleji (1), Ngosha atenanemo (1), Polista (1), Koroboi (1), Mwijiigumo (1)</i>						
Ukerewe (N= 20)	Mzondwa	14	9	11	-	2	3
	Bilagala	8	3	7	5	-	-
	Chilile	7	5	7	4	3	3
	Sinia	5	2	4	1	1	1
	Lutambi	5	-	4	-	3	-
	Mwiyangi	4	1	-	-	1	-
	Simama	1	1	1	-	-	-
<i>Other varieties mentioned (with frequency) were: Balози (1), Sinia (mpya) (1), Malya (1)</i>							

\* sweet refers to good taste rather than amount of sugar, preferred taste is usually described as neither bland nor very sugary.

\*\* Good cooking qualities means soft when cooked, with a short cooking time

\*\*\* Good root flesh colour is generally considered to be yellow or white

The data indicates that two criteria, "Starch/floury" and "tasty/sweet" are particularly important to the consumers in all three regions. Good cooking quality and good flesh colour are also considered. Good storability was mentioned in Mwanza and Ukerewe, but not Meatu. This may be because Meatu is the only one of the three areas where processing is important. Thus (although not indicated in this Table), this is the only area where interviewees considered good processing quality as an important attribute for varietal selection. Criteria for selection are considered in more detail in Section 3.1.5.

### **3.1.4 Varieties considered not acceptable for buying.**

Interviewees were also asked which varieties they did not like to buy, and for what reasons. The results are summarised in Table 5.

The number of varieties mentioned as unacceptable is not as high as those which are mentioned as preferred. This is not surprising as very unpopular varieties are unlikely to be marketed. In most cases individual varieties were mentioned by only one or two interviewees. However, Mzondwa is notable as a variety that was mentioned as unacceptable by several interviewees in both Mwanza and Ukerewe, while Mwiyangi was mentioned by almost 50% of interviewees in Ukerewe and was also mentioned by 2 interviewees in Mwanza. The observations on Mzondwa underline the fact that preference of varieties by consumers is very subjective, and can vary among households. Although considered unacceptable by many households, this variety was specifically mentioned by 14 households in Ukerewe as highly acceptable.

The reasons given for unacceptability of the specific varieties shown in Table 5 are watery roots, bad taste, unattractive root appearance, high fibre content and poor cooking qualities.

**Table 5: Sweet potato varieties considered unacceptable for buying by urban consumers and main criteria considered**

District	Variety	Frequency (No. households mentioning variety)	Bad characteristics ( no. of households)				
			Watery	Not tasty	Fibrous	Hard to cook	Unattractive root appearance
Mwanza ( N= 16)	Mwejigumo	3	3	3	-	-	-
	Mzondwa	3	-	-	1	-	2
	Mwiyangi	2	-	-	-	2	-
	Dagaa	1	-	1	-	-	-
	Julius	1	-	-	-	1	-
	Bilagala	1	1	1	-	-	-
	Mayai	1	1	-	-	-	-
Meatu ( N=10)	I'lyangholongo	2	2	1	-	-	-
	Nzega matolo	1	-	1	-	-	-
	Serena	1	1	-	-	-	-
	Dundugala	1	-	1	-	-	-
	N'goshagagaga	1	1	1	-	-	-
	Pili	1	1	-	-	-	-
	Matungagoso	1	-	1	-	-	-
Ukerewe ( N=19)	Mwiyangi	9	-	8	-	4	-
	Mzondwa	5	-	2	-	-	-
	Sinia	2	1	1	-	-	-
	Mlenga	1	-	-	-	-	-
	Julius	1	-	-	-	1	-
	Bilaila	1	-	-	-	1	-
	Chigole	1	-	-	1	-	-
	Beritha	1	-	-	1	-	-

### 3.1.5 Root characteristics preferred by consumers

After being asked which varieties they liked and disliked and why, interviewees were asked to list the criteria which they considered most important for sweet potato roots. They were then told what criteria people in their district had mentioned and were asked to rank all these criteria in order of importance. It should be noted that these questions are not the same as asking interviewees why they like specific varieties, as it gives them the option of mentioning characteristics that they would like even if there are few varieties with these characteristics. The results are presented in Table 6.

Consumers indicated that sweet potato roots with high starch/dry matter content when cooked are very much preferred. Good taste was also an extremely important criterion. From discussions it was clear that consumers were expressing good taste in many ways. There is some confusion as to how good taste relates to sweetness. In Swahili (the language in which



the interviews were conducted) the word for *tasty* is the same as the word for *sweet*. Some considered a root with high sugar content as good while others considered roots with medium sweetness (neither flat/nor sugary) as good taste. The interviewers tried as much as possible to make the consumers separate all those issues, but this was found to be difficult. It should therefore be taken into account that in this report good taste refers to various attributes and not only the amount of sugar the root possesses.

Results obtained showed that high flour content ranked first, followed by good taste, good cooking qualities and no/less fibre content (Table 6).

Table 6: Storage root characteristics preferred by urban consumers and their ranking.

Characteristic	Number of households mentioning characteristic				Mean household ranking *			
	Mwanza (N=15)	Meatu (N=20)	Ukerewe (N=20)	Total (N=55)	Mwanza (N=15)	Meatu (N=20)	Ukerewe (N=20)	Overall **
Starchy /floury	15	10	12	37	1.4	1.4	1.6	1.5
Good taste	15	8	19	42	1.9	1.8	1.9	1.9
Good cooking qualities/less time to cook and soft when cooked	5	4	6	15	3.0	3.5	1.6	2.7
Non/less fibrous	1	2	4	7	4.0	2.8	2.0	2.9
Good storability	-	1	3	4	-	3.0	3.0	3.0
Good root appearance (shape, size and colour)	3	1	4	8	4.2	4.0	4.1	4.1

- not mentioned

\* Calculated as the mean of the rankings (1 and upwards) given by individual interviewees.

\*\* Calculated as an unweighted mean of the values for the three districts.

### 3.1.6 Sweet potato cultivation

The individuals interviewed were asked if they were growing sweet potato. 35 people out of 58 indicated that they were growing sweet potato (Table 7). Ukerewe had the highest proportion of people (16 out of 20) followed by Meatu (11 out of 20). Many people indicated that sweet potato cultivation in urban areas was carried out in plots near to the house and was considered as part of home gardening.

Sweet potato varieties preferred for cultivation in each district are listed in Table 8. In Mwanza district the major varieties grown were Sinia (mentioned by 6 out of 8 interviewees) and Sugute/Simama (mentioned by 5 out of 8 interviewees). For Meatu urban, varieties mentioned most frequently were Koloboi, Serena and Ngoshagagaga. For Ukerewe urban, variety Mzondwa was grown by a very high proportion of the interviewees (14 out of 16). This was followed by Chilile, Sinia, Bilagala, Mwiyangi and Lutambi.

**Table 7: Households involved in sweet potato cultivation in urban areas of Mwanza, Meatu and Ukerewe districts.**

	Number of households			
	Mwanza	Meatu	Ukerewe	Total
No. households cultivating sweet potato	8	11	16	35
No. households not cultivating sweet potato	10	9	4	23
Total no. Households	18	20	20	58

**Table 8: Sweet potato varieties commonly grown in urban centres.**

Mwanza (Total households cultivating = 8)		Meatu (Total households cultivating = 11)		Ukerewe (Total households cultivating = 16)	
Variety	No. households growing variety	Variety	No. households growing variety	Variety	No. households growing variety
Sinia	6	Koloboi	4	Mzondwa	14
Sugute/Simama (SPN/0)	5	Serena	4	Chilile	6
Budagala	1	Ngoshagagaga	3	Lutambia	6
Mwanalugeto	1	Kinasasa	2	Bilagala	4
Kalamuya Nyerere	1	Ngosha atajaga kukaji	2	Sinia	4
		Sinia	2	Mwiyangi	4
		Sengi	1	Rangimbili	2
		Bulengedi	1	Kiliom	2
		Tulawima	1	Balozi	2
				Malya	1
				Mwezigumo	1

The most common reasons given to explain preferences of these particular varieties for cultivation, ranked by the number of interviewees that mentioned them were: floury/starchy (mentioned by 28 out of 35 households), tasty (22 out of 35 households), high yielding (14 out

of 35 households) and early maturing (8 out of 35 households) (Table 9). Another important characteristic was good processing qualities mentioned only in Mwanza and Ukerewe districts where processing is prominent.

The fact that the two criteria considered most important for choosing varieties for cultivation are concerned with eating quality underlines how vital it is to consider post-harvest qualities when recommending new varieties. It also explains why the varieties preferred for cultivation are generally similar to those preferred for purchasing.

**Table 9: Major criteria mentioned by urban consumers for preferring specific varieties for cultivation.**

Criterion	Number of households mentioning criterion			
	Mwanza (N=8)	Meatu (N=11)	Ukerewe (N=16)	Total (N=35)
Floury/starchy	5	11	7	23
Tasty	5	11	6	22
High yielding	2	5	7	14
Early maturing	1	5	2	8
Good processing qualities	4	4	0	8
Good root characteristics	1	0	2	3
Tolerant to diseases and pests	0	0	3	3
Good extended inground storability	0	0	2	2
Good for leaf vegetable	1	0	0	1



### 3.1.7 Methods of preparing sweet potato for consumption and choice of variety.

Tables 10 and 11 show the different preparation methods at household level and varieties preferred for each method.

The main preparation methods of sweet potato roots include boiling of whole roots (mentioned by 46 out of 58 households), soft mixed meals (21 out of 58 households), slicing into dry chips 'matoborwa' and frying of fresh chips (Table 11).

The names of the varieties mentioned by interviewees as preferred for individual preparation methods are shown in Table 11. In Mwanza urban sweet potato varieties Simama and Sinia were considered suitable for almost all preparation methods and in Ukerewe, variety Mzondwa was mentioned as suitable for all purposes. However, in many other cases there were preferences for particular varieties for particular purposes.

*N.B. Varieties suitable for processing into Michembe and Mataborwa are discussed in a later section, specifically on processing. This is because when buying these products it is not easy to distinguish between varieties and generally only households that carry out processing are aware of which varieties are used.*

**Table 10: Ways by which Sweet potatoes are prepared for eating by urban consumers**

Preparation Method	Number of households which use this method			
	Mwanza (N=18)	Meatu (N=20)	Ukerewe (N=20)	Total (N=58)
Boiling (Whole roots)	18	14	14	46
Mixed with nuts/beans/etc to make soft meals	9	6	6	21
Slicing into <i>Michembe/Matoborwa</i> *	6	12	-	18
Frying	4	4	4	12
Roasting	2	1	2	5
Flour for porridge	0	1	1	2

\* includes households which purchases these products

**Table 11: varieties considered most suitable for each preparation method.**

Mwanza (N = 11)	No. of households	Meatu (N = 20)	No. of households	Ukerewe (N = 20)	No. of households
<b><u>Boiling</u></b> Sinia Simama/Suguti (SPN/O) Mzondwa Kasamwa Polista	7 6 2 2 1	<b><u>Boiling</u></b> Kaputula Nyerere Serena No difference	1 1 1 10	<b><u>Boiling</u></b> All Mzondwa	19 1
<b><u>Mixing with other dishes</u></b> Mzondwa Kasamwa Sinia Simama/suguti (SPN/O)	1 2 3 3	<b><u>Mixing with other dishes</u></b> Serena Kibluu Ngoshaatena nimo Ntulawima	1 1 2 1	<b><u>Mixing with other dishes</u></b> Mzondwa	1
<b><u>Roasting</u></b> Mzondwa Lutambi Simama/Suguti (SPN/O) Sinia	1 1 1 1	<b><u>Roasting</u></b> Serena Nzegamatolo	1 1	<b><u>Roasting</u></b> Mzondwa	1
<b><u>Frying</u></b> Simama/Suguti (SPN/O)? Sinia	2 2	<b><u>Frying</u></b> Matungangoso Koroboi	1 1	<b><u>Frying</u></b> Mzondwa	1

### 3.1.8 Storage of fresh sweet potato roots after purchase by urban consumers:

Consumers were asked whether or not they stored sweet potato roots after purchase. 42 out of 58 interviewees indicated that they did (Table 12). This consisted of 61% consumers in Mwanza, 65% in Meatu and 90% in Ukerewe.

In Meatu, consumers depended mainly on weekly market days to purchase sweet potato roots and at the time of the study no sweet potato traders were found in the central permanent market. This means that short-term storage would be necessary for anyone wishing to use sweet potato every day. In Ukerewe and Mwanza however, although sweet potato roots were sourced from the permanent markets, individuals found it convenient to buy enough sweet potato roots that could keep for at least 3 to 4 days before going back to the market. After purchase sweet potatoes were mainly kept in the houses on the floor, although another common method of storage (mentioned by 50% of interviewees) was the place inside recycled fertilizer bags (Table 13).

In most cases sweet potatoes were stored for 1-3 days (24 out of 37) (Table 14). A small proportion of individuals indicated that they would keep sweet potato roots even beyond one week. This was said to be possible with the better storing varieties as long as roots were

undamaged. 23 out of 42 interviewees indicated that they believed there were some varieties that stored better than others (Table 15). The mostly frequently mentioned varieties were Sinia and Simama in Mwanza, Koloboi and Ipembe Iya ngh'olongo for Meatu, and Chilile and Mzondwa for Ukerewe (Table 16).

**Table 12: Extent of Storage of fresh sweet potato roots after purchase by urban consumers**

	Number of households			
	Mwanza (N=18)	Meatu (N=20)	Ukerewe (N=20)	Total (N=58)
Sweet potato stored	11	13	18	42
Sweet potato not stored	7	7	2	16

**Table 13: Storage facilities used for fresh sweet potato roots by urban consumers after purchase.**

Storage Facility	Number of households			
	Mwanza (N =11)	Meatu (N = 13)	Ukerewe (N = 18)	Total (N =42 )
In house on floor as heaps	7	5	9	21
Fertilizer bags	4	4	1	9
Pits	0	0	5	5
Sacks	0	2	1	3
Other	0	2	2	4

**Table 14: Normal Storage time of fresh sweet potato fresh roots after purchase in urban households**

No. of days	Number of households			
	Mwanza (N = 8)	Meatu (N = 11)	Ukerewe (N = 18)	Total (N = 37)
1-3 days	5	7	12	24
4-7 days	1	2	4	7
8-14 days	2	2	2	6

*N.B. only 37 of the 42 households which practised some form of storage responded to the question about time of storage.*

**Table 15: Opinions of urban consumers on the existence of better storing varieties**

Existence of better storing varieties	Number of households			
	Mwanza (N=11)	Meatu (N=13)	Ukerewe (N=18)	Total (N=42)
None	3	6	10	19
Yes	8	7	8	23

**Table 16: Sweet potato varieties considered by urban consumers to store well.**

Mwanza (N = 8)	No. of households	Meatu (N = 7)	No. of households	Ukerewe (N = 8)	No. of households
Sinia	5	Ipembe	2	Chilile	3
Simama	2	Koloboi	2	Mzondwa	3
Budagala	1	Sengi	1	Sinia	1
Julias	1	Serena	1	Rangimbili	1
Mwiyangi	1	Ngosha atena nimo	1		



### 3.1.9 Losses experienced and control measures used during storage of fresh roots.

Consumers were asked if they experienced damage when storing sweet potato roots. About 79% indicated that there were different types of damage observed during storage (Table 17). Rotting was mentioned frequently (18 out of 35 households), followed by shrivelling of roots (15 out of 35 households). Other types included wilting (probably the same as shrivelling) and change in colour (Table 18).

**Table 17: Indication by urban consumers as to whether they experienced damage during the storage of fresh roots.**

Damage experienced	Number of households			
	Mwanza (N = 11)	Meatu (N = 13)	Ukerewe (N = 18)	Total (N = 42)
Yes	8	11	14	33
No	3	2	4	9

**Table 18: Types of damage experienced during storage of fresh roots at household level.**

Type of damage experienced	Number of households			
	Mwanza (N = 8)	Meatu (N = 11)	Ukerewe (N=14)	Total (N=33)
Rotting	8	3	7	18
Shrivelling	4	11	0	15
Wilting	1	1	2	4
Change in colour	0	0	5	5

24 out of the 33 households that experienced damage indicated that they would take control measures (Table 19), and only 9 were not taking any control measures against the observed damages. Major control measures practised were pit storage or the purchase of few roots regularly for immediate use in order to reduce storage time (Table 20). The use of pit storage techniques was practised mainly in Ukerewe where 4 out of the 8 households which used control methods indicated that they were using this technique. For pit storage, individuals indicated that careful selection of the roots should be carried out, while roots with apparent symptoms of any type of damage should not be stored. Careful selection of roots probably explains the extended storage life of roots beyond one week using this technique.

**Table 19: Indication by urban households of whether control measures are taken against damage during root storage.**

Taking of control measures	Number of households			
	Mwanza (N = 8)	Meatu (N = 13)	Ukerewe (N = 14)	Total (N =35 )
Yes	6	10	8	24
No	2	3	6	11

**Table 20: Nature of control measures taken by urban consumers against damage.**

Nature of control measures taken	Number of households			
	Mwanza (N = 6)	Meatu (N = 10)	Ukerewe (N = 8)	Total (N = 24)
Frequent purchase of small amounts of roots for immediate use	3	6	4	13
Pit storage	2	3	4	9
Sprinkle water on roots	1	-	0	1
Slicing for michembe	-	1	0	1

### 3.1.10 Use of processed sweet potato:

The use of processed sweet potato was mainly reported in Meatu (mentioned by 75% of interviewees) and to some extent Mwanza (50%) (Table 21), whereas in Ukerewe, consumers indicated that sweet potato was only used in fresh form. The following information therefore refers only to Meatu and Mwanza.

The major products mentioned were "*Michembe*" and "*Matoborwa*". (Table 22)

Michembe is made by slicing and sundrying sweet potato, while to make Matoborwa roots are cooked, sliced and sundried. Further details of processing techniques for each product are explained in Kapinga *et al.*, (1995).

The processed products were either obtained from the markets or were processed at home, in roughly equal proportions (Table 23). Only 6 out of 21 households indicated that they bought sweet potato processed products from the markets alone (Table 23).

Sweet potato varieties preferred for processing at both locations are presented in Table 24. Variety Sinia was commonly used in Mwanza area, whereas for Meatu, where processing is at an advanced stage, a number of varieties have already been identified by consumers.

**Table 21: The extent of processing by urban households in Meatu and Mwanza districts.**

Use of processed products	No. of households			
	Mwanza (N = 18)	Meatu (N =20)	Ukerewe (N=20)	Total (N =58 )
Yes	6	15	0	21
No	12	5	20	37

**Table 22: Types of processed products used by urban consumers in Mwanza and Meatu districts.**

Types of products	Number of households		
	Mwanza (N = 6)	Meatu (N = 15)	Total (N = 21)
Michembe	6	14	20
Matobolwa	2	13	15

**Table 23: Source of processed products used by urban consumers in Mwanza and Meatu districts.**

Source	Number of households		
	Mwanza (N=6)	Meatu (N=15)	Total (N=21)
Processed at home	3	2	5
Bought	3	3	6
Both	0	10	10

**Table 24: Sweet potato varieties preferred for processing at household level in Mwanza and Meatu districts**

Mwanza (N = 3)		Meatu (N=10)	
Variety	No. of households preferring variety	Variety	No. of households preferring variety
Sinia	2	Sengi	2
Budagala	1	Ipembelyangholongo	2
Simama	1	Ukerewe	2
		Serena	1
		Bluu	1
		Mwanabukwimba	1
		Mwabushida	1

### 3.1.11 Marketing of processed products.

In both Mwanza and Meatu marketing of processed products was not a very common practice. In Mwanza, none of the households indicated that they were selling processed sweet potato. Similarly in Meatu, only one of the ten households which processed sweet potato indicated that they were selling surplus processed products at the market. In this case the normal price was Tshs. 1000/= per tin during low season and Tshs. 500/= per tin during high season. In all other cases processed sweet potato produced at household level was used primarily for home consumption.



### 3.1.12 Storage of processed products

A large proportion of households (19 out of 21) mentioned that they stored sweet potato processed products (Table 25). Usually Fertilizer or gunny bags are used (16 out of 19 interviewees) (Table 26). Other facilities for storage include sacks, tins and local grannaries. In Meatu, products were said to store for 13-24 months (Table 27), whereas in Mwanza the maximum storage time reported was only 2-5 months. The reason for the longer reported storage time in Meatu is probably due to the more prominent use of the product *Matoborwa* rather than *Michembe* in Meatu, whereas *Michembe* is more commonly processed in Mwanza. The latter is more prone to storage pests and rotting if not well dried and stored. *Matoborwa* products are boiled before slicing and drying, and hence have tough outer skin which cannot allow easily the penetration of insects borers, and may also be more resistant to rotting. Some of the households in Meatu, mentioned the existence of some varieties that produced products that stored very well. Varieties Serena, Ntulawima and Ukerewe were mentioned in this context. In Mwanza however, no single variety was considered better for storing than others.

**Table 25: Extent of storage of processed products by urban households**

Whether or not processed products are stored	No. of households		
	Mwanza (N = 6)	Meatu (N = 15)	Total (N = 21)
Yes	4	15	19
No	2	0	2

**Table 26: Types of storage facilities used for storing processed products by urban consumers**

Storage facility	No. of households		
	Mwanza (N = 4)	Meatu (N = 15)	Total (N = 19)
Fertilizer/gunny bags	3	13	16
Sacks	3	2	5
Tins	1	0	1
Local grannaries	0	1	1

*N* refers to the number of households which store processed products

**Table 27: Storage period of processed products as indicated by urban consumers.**

Storage time	Number of households		
	Mwanza (N = 4)	Meatu (N = 15)	Total (N = 19)
Less than one month	1	1	2
One month	1	1	2
2-5 months	2	1	3
6-12 months	0	1	1
13-24 months	0	8	8

*N* refers to the number of households which store processed products  
*N.B.* not all households which store products gave a storage time.

### **3.1.13 Deterioration of the processed products during storage and control measures at household level**

The major forms of deterioration experienced during the storage of processed products are pest attack e.g. weevils and the larger grain borer (LGB), and mould, particularly on the *Michembe* (Table 28). Some households had methods to control losses (8 out of 19) while the rest did not (Table 29). These control measures varied with location. In Meatu four different control measures were mentioned, the prominent ones being processing small amounts at a time, and the use of the chemical *Actellic super* to dust the products (Table 30).

The price of damaged products in the markets were said to be reduced to half that of non-damaged stored products. The damaged slices are sometimes fed to domestic animals. This was mentioned in Meatu district. However, damaged products are normally discarded.

**Table 28: Forms of deterioration experienced by urban consumers during storage of processed products**

Type of damage	Number of households		
	Mwanza (N = 4)	Meatu (N = 15)	Total (N = 19)
Pest attack e.g. weevils, Large Grain Borer (LGB)	2	10	12
Moulds (rotting)	1	1	2

*N refers to the number of households which store processed products*

*N.B. not all households which store products answered this question.*

**Table 29: Number of Households which use Control measures during storage of processed products.**

Taking control measures	Number of households		
	Mwanza (N= 4)	Meatu (N = 15)	Total (N= 19)
Yes	2	6	8
No	2	9	11

*N refers to the number of households which store processed products*

**Table 30: Types of control measures taken by urban consumers against deterioration of stored processed products**

Type of control measure	Number of households		
	Mwanza (N=2 )	Meatu (N = 6)	Total (N = 8)
Short period of storage only	0	1	1
Process a small amount only	0	2	2
Separate 'matoborwa' from 'michembe'	0	1	1
Use Actellic Super	0	2	2
Dry the processed root from time to time	1	0	1
Mix with ash	1	0	1

*N refers to the number of households which take measures to prevent losses during storage.*



## 3.2 TRADERS

### 3.2.1 Sweet potato marketing

A total of 25 traders were interviewed from the three districts. Traders were selected on the basis that they were known to sell sweet potato. The number of traders interviewed in each market, and the size of the markets is given in Table 1b.

Most of the traders interviewed were selling primarily directly to consumers (34 out of 35), although a number also sold to retailers and in some cases to wholesalers (18). (Table 32). In Ukerewe the traders were selling exclusively to consumers.

The amount of sweet potato sold per week by the traders interviewed varied considerably both between individual traders and between markets (Table 31). In Ukerewe market, the amount sold ranged from half a bag to 5 bags per week, whereas in Mwanza market total sales could go up to ten bags per week. The variations observed can probably be explained by the fact that in Ukerewe the majority of the sweet potato traders are retailers, whereas in Mwanza most of the traders interviewed were wholesalers.

Sweet potato roots marketed in Mwanza were mainly sourced from Ukerewe and other islands in Lake Victoria. Other sources were used, however, particularly in the month of December when many sweet potato roots came from Sengerema districts.

The price of sweet potato roots varies with the availability. For example during low supply seasons in Mwanza, a bag weighing about 100 kilograms was reported to have a price between 8,000/= and 12000/= Tanzanian shillings; as compared to the peak supply season when the price would drop to 2000/= to 4000/= per bag. (Table 33). This was the trend for all of the areas visited. Sweet potato fetched higher prices in Meatu than in the other districts. Sweet potato is a staple food in Meatu district together with millets/sorghums, which might account for the high prices. It was interesting to note that in Mwanza markets, the price quoted for sweet potato was less than that of Ukerewe despite the fact that sweet potato roots were sourced from Ukerewe. Traders attributed this to availability of alternative crops such as maize, rice and cassava in the markets of Mwanza.

Generally, traders felt that there were insignificant differences in prices between the varieties commonly sold (Table 34). This might be explained by the fact that all the varieties preferred for trading had similar characteristics, the major ones being high content of starch, good taste, attractive skin and root flesh colour, and good root shape. (Any differences in value may also be less obvious at the retail level due to the practice of selling sweet potatoes in constant price heaps, such that a difference in value would result in a different size of heap rather than a different price.)

**Table 31: Quantity of fresh sweet potato roots sold per week by traders**

Average number of bags* sold per week	Number of traders			
	Mwanza (N=16)	Meatu (N=11)	Ukerewe (N=8)	Total (N=35)
0.5 -1	2	4	6	12
2-5	9	5	2	16
6-10	2	2	0	4
> 10	3	0	0	3

\*A bag is usually approximately 100 Kg

**Table 32: Categories of sweet potato customers**

Categories of customers	Number of traders			
	Mwanza (N=16)	Meatu (N=11)	Ukerewe (N=8)	Total (N=35)
Consumers	16	10	8	34
Retailers	7	4	0	11
Wholesalers	2	5	0	7

**Table 33: Indicative average prices for sweet potato roots during low and peak supply seasons**

Period	Amount in (Tshs/100 kg. bag)*			
	Mwanza (N=7)	Meatu (N=9)	Ukerewe (N=8)	Range
Low supply	8000-12000	12000-16000	8500-12000	9500-13000
Peak supply	2000-4000	6000-10000	5000-10000	4000-8000

\* Prices quoted determined through interviews with traders, rather than by direct observation.

**Table 34: An indication of price differences by variety as perceived by sweet potato traders**

	Number of traders			
	Mwanza (N=16)	Meatu (N=11)	Ukerewe (N=8)	Total (N=35)
There are price differences by variety	4	0	1	5
There are no price differences by variety	12	11	7	30

### 3.2.2 Storage of fresh sweet potato roots in the market places:

In Mwanza and Ukerewe markets, most traders store sweet potato roots at the place of sale (Table 35). In Meatu however, since most traders sell the sweet potato during the weekly market day, only one trader indicated that he stored sweet potato at the place of sale.

Traders indicated that they were storing sweet potato in such a way so as to avoid deterioration. The major storage facilities used are sacks/bags. (78%), whereas a few traders mentioned that they were using boxes, others used holes in the ground, while others spread the roots on the ground (Table 36). The storage period ranged from 1-7 days in the market (Table 37). However many traders (50%) indicated that they did not store sweet potato roots beyond 3 days. Traders indicated that most of varieties purchased at farm level could keep well for only 3 days, whereas a few varieties could be kept for between 4 and 5 days.

Major types of deterioration experienced during storage are rotting followed by wilting/withering. Some traders also mentioned breakage, but this probably occurred during transport rather than storage (Table 38). Given the bulkiness of the roots, lack of space was considered a serious constraint for storage.

**Table 35: Storage of fresh sweet potato roots by traders at the place of sale**

Storage of roots	Number of traders			
	Mwanza (N=16)	Meatu (N=11)	Ukerewe (N=8)	Total (N=35 )
Sweet potato stored at market	15	1	7	23
Sweet potato not stored at market	1	10	1	12

**Table 36: Type of storage facility usually used for sweet potato roots in the market.**

Type of storage facility	Number of traders			
	Mwanza (N=15)	Meatu (N=1)	Ukerewe (N=7 )	Total (N= 23)
Bags/sacks	11	1	6	18
Boxes	4	0	0	4
Floor	1	0	2	3
Holes	0	0	1	1

*N refers to the number of traders practising storage*

**Table 37: Storage time for fresh sweet potato roots at the place of sale**

Storage period (days)	Number of traders			
	Mwanza (N=15)	Meatu (N=1)	Ukerewe (N=7)	Total (N=23)
1-3	6	1	4	11
4-5	6	0	2	8
6-7	2	0	2	4

*N refers to the number of traders practising storage*



**Table 38: Types of damage experienced during storage of sweet potato roots at the place of sale.**

Type of damage	Number of traders			
	Mwanza (N=16)	Meatu (N=11)	Ukerewe (N=8)	Total (N=35)
Wilt/withering	5	7	3	15
Breakage	0	2	0	2
Rotting and rat attack	15	2	6	23

### 3.2.3 Variety preferences by market traders

Table 39 shows the sweet potato varieties preferred for selling at different market locations. For Mwanza market, variety Polista was most frequently mentioned followed by variety Sinia. It is interesting to note that during the survey of consumers, the variety Polista was mentioned by only one household in Mwanza. Polista is known very well by traders, but is still new to consumers. Traders noted that the variety Simama/Suguti was preferred by consumers. However, traders indicated that this variety provided a problem, as it would not keep beyond one week, particularly if heavily damaged during transportation.

In Ukerewe, varieties Mzondwa and Chilile were mentioned frequently (7 out of 8 traders in both cases). In Meatu urban, traders preferred varieties Sinia/Kasinia and Nzega matolo (7 and 6 out of 11 traders).

The varieties commonly traded in Mwanza market were sourced from Sengerema, Ukerewe and other islands in Lake Victoria. For Meatu the sweet potato roots were obtained mainly from the nearby villages during the high peak and during low season from wet areas of a major river bordering Singida and Meatu. For Ukerewe, sweet potato roots were sourced from the nearby villages.

The main reasons given for the preference of the sweet potato varieties commonly sold are also given in Table 39. Not surprisingly, the findings are similar to those obtained during interview of consumers. The characteristics mentioned most frequently were: high starch/flour content, good taste, and attractive root skin and flesh colour. The definition of good root flesh colour appears to be very subjective; some traders prefer to sell yellow fleshed roots, while others prefer white fleshed roots. Mixed colours in root flesh are said not to be preferred by many customers.

As for the survey of consumers, traders were asked to rank the characteristics of fresh roots according to their perception of the characteristics considered important by their customers. The ranking gave a very similar trend to the characteristics originally mentioned (Table 41).

Thus high flour/starch content ranked first, followed by good/appealing root taste and attractive skin colour/root appearance.

The sweet potato varieties avoided or rejected for selling at different market locations are presented in Table 40. For Mwanza market these include varieties Mzondwa and Bilagala. For Meatu, variety Siri was most frequently mentioned and for Ukerewe; Mwiyangi and Mzondwa were highlighted. Reasons mentioned by traders for avoiding varieties were Watery roots, high fibre content, poor root storability after purchase and unattractive skin and root flesh colour. This correlates well with the reasons given for variety preferences.

**Table 39: Sweet potato varieties most preferred for selling by traders and main criteria considered.**

District	Variety	Frequency (no. traders mentioning variety)	Preferred characteristics (No. of traders)									
			Starchy/ floury	Good taste	Good skin and colour	Good stability	Good processing quality	Good cooking quality	High yield *	Good shape and size	Easy marketed	Pest resistant *
Mwanza (N=16)	Polista	16	13	7	11	3	-	-	-	-	1	-
	Simia	13	10	1	4	2	-	-	-	2	-	-
	Malya	6	3	4	4	-	-	-	-	-	-	-
	Simama/ Sugutu	4	4	1	3	-	-	-	-	1	-	-
	Chilile	3	2	-	-	-	-	-	-	-	-	-
	Mzoodwa	2	1	1	-	1	-	-	1	-	-	-
	Balozzi	1	-	-	1	-	-	-	-	-	-	-
Meatu (N=11)	Simia**	7										
	Nzega/ Nzega matolo	6	5	4	2	-	-	-	-	-	1	-
	Kabuhulu/ Kinasa**	5										
	Suguti/ Simama**	3										
	Ipenbe -lyangho -longo	2	1	1	1	-	1	1	1	1	-	-
	Mhini	2	-	-	-	-	-	-	-	1	-	-
	Siri	2	-	-	-	-	-	-	-	-	-	1
	Kagole	1	1	-	-	-	-	-	-	-	-	-
	Nihamb -agesengi	1	1	1	-	-	-	-	-	-	-	-
	Serena	1	-	-	-	1	-	1	-	-	-	-
Ngulo	1	1	1	-	-	-	-	-	-	-	-	
Misonge	1	-	1	-	-	-	-	-	-	1	-	
Ukerewe (N= 8)	Mzondwa	7	5	6	-	1	-	1	1	-	-	1
	Chilile	7	4	6	3	-	1	1	1	-	-	2
	Lafambi	1	1	1	-	-	-	-	-	-	-	-
	Bilagala	1	-	1	-	-	-	-	-	-	-	-
	Simia	1	-	1	-	-	-	-	-	-	-	-

\* These attributes were indicated by traders who also grew sweet potatoes for marketing.

\*\* Data on preferred characteristics missing for these varieties

**Table 40: Sweet potato varieties rejected for selling by traders and main criteria considered.**

District	Variety	Frequency (no. traders mentioning variety)	Disliked characteristics ( No. of traders)										
			Not starchy	Watery	Bad taste	Bad storer	Fibrous	Poor skin and flesh colour	Poor cooking quality	Not easily marketed	Late maturing *	Requires high rainfall *	Low yielding *
Mwanza (N=16)	Mzondwa	9	2	5	2	3	1	3	2	-	-	-	-
	Bilagala	9	1	3	1	2	-	2	3	-	-	-	-
	Nzito	1	-	-	-	1	-	1	-	-	-	-	-
	Chilile	4	-	3	-	-	-	1	-	1	-	-	-
	Mwejugumo	1	-	-	1	-	1	-	-	-	-	-	-
	Malya	1	-	-	-	1	-	-	-	-	-	-	-
Meatu (N=11)	Siri	3	-	2	-	-	-	-	-	-	-	-	-
	Mobili	1	1	2	1	-	-	-	-	1	-	-	-
	Ngonha	2	-	-	-	-	-	-	-	-	-	-	-
	Kaptula	1	-	-	-	-	-	-	-	-	1	-	1
	Maselena	2	-	-	-	-	1	-	-	-	-	1	-
	Mapembe	1	-	1	-	-	-	-	-	-	-	-	-
	Ntulawima	1	-	-	-	-	-	-	-	-	-	-	1
	Blanketi	1	-	-	-	-	-	-	-	-	1	1	-
Serena	1	1	-	-	-	-	1	-	-	-	-	-	
Ukerewe (N= 8)	Mwiyangi	2	-	-	-	1	-	-	-	-	-	-	-
	Mzondwa	2	-	-	-	-	-	1	-	-	-	-	-

\* These attributes were indicated by traders who also grew sweet potatoes for marketing.



**Table 41: Traders' perception and ranking of good root characteristics of sweet potato.**

Root characteristic	No. traders mentioning characteristic				Mean ranking given by traders.			
	Mwanza (N=16)	Meatu (N=11)	Ukerewe (N=8)	Total (N=35)	Mwanza (N=16)	Meatu (N=11)	Ukerewe (N=8)	Total (N=35)
Starchy/floury/high dry matter content	11	5	5	21	1.1	1.0	1.8	1.3
Good taste	7	4	7	18	2.0	2.2	1.4	1.8
Attractive skin and flesh colour	7	5	3	15	1.7	1.7	2.0	1.8
Big size	5	0	1	6	2.8	-	2.0	2.4
Low/no fibre content	0	0	2	2	-	-	2.6	2.6
Good root shape	2	1	2	5	3.0	3.0	2.5	2.8
Good cooking qualities+	0	1	1	2	-	3.0	3.0	3.0
Tolerant to bruises and rotting	1	1	1	3	3.0	4.0	4.0	3.7

+ *Less time to cook and soft when cooked*

- *not mentioned*

\* *Calculated as the mean of the rankings (1 and upwards) given by individual interviewees.*

\*\* *Calculated as an unweighted mean of the values for the three districts.*

## 4. MAJOR FINDINGS AND RECOMMENDATIONS FOR FUTURE INTERVENTIONS.

### 4.1 Varietal preferences

The main objective of the survey reported here was to identify the characteristics that urban consumers consider important in sweet potato varieties for fresh consumption and also for processing. One way to obtain this information is to determine which specific varieties consumers prefer and why.

The total number of varieties mentioned by name was high, with over 40 varieties mentioned for the three districts. Given the high number of varieties and the relatively small scale of this survey it would be difficult to come up with definitive rankings of cultivars. However certain observations are possible. Although the situation may be confused where the same variety is known by different names, the range of available varieties appears to differ significantly with location. Varietal preferences also appeared to differ with location, probably due both to regional variations in the availability of varieties and differences in the tastes of the local people. However, the variety Sinia was notable as it was identified as the most popular in both Mwanza and Meatu, and ranked fourth in Ukerewe. On the other hand, Mzondwa was the most popular variety among consumers in Ukerewe, but was not preferred in either other district. Ukerewe Island is a major sweet potato producer for all districts covered in this survey, but appears to grow Mzondwa primarily for local consumption. The possibility that this variety has a different name elsewhere has yet to be investigated. The case of Mzondwa also underlines the subjective and variable nature of consumer preferences. Although considered a good variety by 14 households in Ukerewe, it was mentioned as a bad variety by 5 households in Ukerewe and 3 in Mwanza.

The variety Sugute/Simama (not to be confused with Suguti) also deserves mention. This variety, also known as SPN/0, has been assessed by research institutes throughout Tanzania. It has been found to be very popular with consumers, and also appears to be widely available. However, although identified as a popular variety in Mwanza it was not mentioned in either Meatu or Ukerewe.

When comparing varietal preferences of traders with those of consumers there was reasonable agreement, but with some notable exceptions in Mwanza and Meatu. For example, Polista is the most popular variety among traders in Mwanza, but was not mentioned by consumers interviewed in any district. This is probably an example of a new variety that consumers have yet to learn to recognise. In Meatu, Nzega is one of the most popular varieties for traders, but does not rank as high for consumers. On the other hand Selena is popular among consumers and ranks low with traders. The reasons for these differences are unknown. It was notable that agreement between consumers and traders was strongest in Ukerewe, which could be a consequence of the fact that this is a sweet potato producing area.

Interestingly most traders (30 out of 35) did not consider that consumer preferences resulted in price differentials between varieties, but this has not been verified by market observations.

Consumers who also grew their own sweet potatoes were asked which varieties they preferred to grow. The ranking of varieties in this case was similar but not identical to the varieties preferred for buying.

Both consumers and traders were asked to list the varieties that they least liked. The agreement was not as high as for preferred varieties but this could be due to the fact that less popular varieties are less used and therefore less available.

#### **4.2 Quality criteria**

With respect to quality criteria considered most important for fresh sweet potato roots a very consistent picture emerged. Consumers were asked two separate questions, one referring to the reasons why they preferred the varieties they did, and the second asking which would be the most important characteristics of an "ideal" variety. The findings from these two questions were very similar. Both consumers and traders considered that high dry matter content (also expressed as starchy, or floury) and good taste were the most important criteria. This was followed by cooking quality (referring to the time needed for cooking) and the colour of the flesh and skin. Other criteria mentioned were low fibre content, good storability after purchase and root size.

When those consumers who also grew their own sweet potatoes were asked to list the criteria for selection of varieties, the two most important criteria were again, high dry matter and good taste. These were followed by high yield, early maturity and for Mwanza and Meatu, good processing quality.

#### **4.3 Storage of fresh sweet potato roots**

Both consumers and traders said that they stored sweet potato roots, but only for a few days. At the household level most consumer would not store beyond 3 days, while in the market it was relatively common to store up to 5 days. Consumers were divided as to whether some varieties stored better than others, but certain varieties were highlighted as storing well, including Sinia, Simama, Ipembe, Koloboi, Chilile and Mzondwa. The main forms of deterioration mentioned during storage were rotting, shrivelling and wilting. The latter two probably both refer to water loss. Neither sprouting nor changes in taste were mentioned. This finding agrees with results of trials conducted at a number of research institutes around Tanzania during post-harvest evaluation of locally available varieties.

#### **4.4 Processing of sweet potato roots**

Although none of consumers interviewed in Ukerewe used processed sweet potato, probably due to a constant supply of fresh roots, processing was carried out to some extent in Mwanza and was common in Meatu. Two types of product, Michembe and Matobolwa were used. Consumers obtained their processed products either by processing at home or buying from the market in roughly equal proportions. There were distinct cultivar preferences for processing, especially in Meatu, and these did not correspond to the varieties that are preferred for fresh consumption. Most households that used processed products would store them, usually in sacks. A storage period of 13-24 months was usually possible. Insect attack was said to be the most important form of loss, and various control methods were described.



## 4.5 RECOMMENDATIONS

- I. During breeding and testing of sweet potato varieties, emphasis should be placed on selecting those that have the quality criteria highlighted by consumers and traders (see (2) above), especially those which are starchy/mealy and have good taste. It is assumed that starchy/mealy correlates with high dry matter content, but this has yet to be verified. Taste is a subjective quality, and the relationship between "good taste" as perceived by consumers and measurable characteristics is unknown and should be investigated. The most practical way of assessing these characteristics for new varieties is probably to use trained taste panels on-station related to consumer tests off-station.
- II. Storability is one of the qualities identified as being a desirable characteristic, although not as high priority as quality. It is notable that most consumers and traders do not expect to store sweet potatoes for more than a few days. An extension of shelf-life would greatly increase the potential for transporting and trading this commodity. For future interventions some in-depth investigations should be carried out concentrating on the identification of root qualities associated with extended shelf-life, to enable easy selection of better storing varieties.
- III. The main losses experienced during storage are rotting and water loss. Improvement of storage methods could probably make a big improvement in shelf-life. Given the impracticality of refrigeration in Tanzania the main environmental factor that can be manipulated is humidity. Investigations to determine the optimum relative humidity of storage needed for moisture retention but low rotting should be carried out.
- IV. The increased utilization of processed products in urban areas could maximize the potential value of sweet potato by minimizing the losses incurred during storage of fresh roots. However, processed sweet potato is still not commonly consumed in urban areas. This may be due partly to lack of knowledge of processed products, but may also be due to low quality. There is a need to obtain more information about the quality criteria associated with good processed products, including the characteristics of a good processing variety.
- V. No information has yet been collected to quantify the varieties presently sold. This would be a very useful baseline study, and essential if impact assessments are to be carried out in future when the National Programme starts to release new varieties.

### 5. Literature cited:

Kapinga, R.E., P.T. Ewell, S.C. Jeremiah (1995). Sweet potato in Tanzanian Farming and Food Systems: Implications for Research. Ministry of Agriculture, Tanzania and International Potato Centre (CIP), Nairobi, Kenya. 47p.

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## Appendix I

### PREFERENCES FOR SWEET POTATO BY URBAN CONSUMERS AND TRADERS

#### CHECKLIST FOR SEMI-STRUCTURED INTERVIEW

##### Consumers

###### **Introduction:**

This survey is being conducted by the National Root and Tuber Crops Programme to find out which characteristics consumers like for sweet potato. This will help the Programme to select and release the best varieties.

###### **Background information**

The following information should be noted by the interviewer, but not necessarily asked directly.

1. Location of house
2. Income group
3. Ethnic origin

###### **Interview**

4. How often does your family eat sweet potato?  
e.g. number of times per week
5. How many people are there in your household?
6. How much do you spend on buying sweet potatoes per week? Fresh? Processed?
- 7a. (i) Which sweet potato varieties do you prefer to buy, and what are the reasons?  
If the variety name is not known, go to 7b.

Varieties	Good characteristics

7a (ii). Are there any sweet potato varieties that you avoid buying, and what are the reasons?

Varieties	Reasons for avoiding

7b. What characteristics do you like in a sweet potato? Can you rank these in order of importance.

Preferred Characteristics	Ranking

8 (i). Do you grow sweet potatoes?

(ii) If yes, which varieties and for what reason?

Name or description of varieties	Reasons for preference

9. (i). Do you store sweet potato roots after purchase?
- (ii) If no:  
Are there reasons why you do not store?
- (iii) If yes: Where?
- (iv) For how long?
- (v) Do you find that some varieties store better than others, and which?
- (vi) What type of damage (quality losses) do you experience, if any?
- (vii) What control measures do you use?

10. By what methods to you cook your sweet potatoes for eating?  
Do you find that some varieties are better for certain preparation methods than others?

Method of preparation	Best varieties Describe if name unknown.

11. (i). Do you use processed sweet potato roots?
- (ii) If yes, which products?
- (iii) Do you buy the processed products, or process them yourself?
- (iv) If you process yourself, which varieties do you prefer to process, and why?
12. (i) Do you sell processed products?
- (ii) If yes, who do you sell them to?
- (iii) How much do you sell?
- (iv) What are the prices?/throughout the year?

13. (i) Do you store processed products?
- (ii) If yes: Where?
- (iii) For how long?
- (iv) Do you find that some varieties store better than others, which?
- (v) What type of damage (quality losses) do you experience, if any?
- (vi) What control measures do you use?



**PREFERENCES FOR SWEET POTATO  
BY URBAN CONSUMERS AND TRADERS**

**CHECKLIST FOR SEMI-STRUCTURED INTERVIEW**

**Market agents**

**Introduction:**

This survey is being conducted by the National Root and Tuber Crops Programme to find out which characteristics consumers like for sweet potato. This will help the Programme to select and release the best varieties.

**Background information**

1. Location of market
2. Size of market
3. What type of trader (i.e. itinerant, wholesaler, or retailer)

**Interview**

4. Do you trade in any crops other than sweet potato? If so, what proportion of your trade is in sweet potato?
5. How much do you sell per week / per month / per year?
6. Where do you obtain most of your sweet potatoes? Name the towns and villages in order of importance.

Village or town	District/Region	Distance from here

7. What type of customers buy sweet potatoes?

### Preferred characteristics and varieties

8a. (i) Which varieties do you like to sell and why?

[If the variety names are not known, go to 8b]

*N.B. These characteristics may include both the characteristics preferred by consumers [texture, colour, price], and also any characteristics that make that variety good for trade [storability]*

Varieties	Good characteristics

8a. (ii) Which varieties do you not like to sell, and why?

Varieties	Reasons for avoiding

8b. What characteristics do you like in a sweet potato? Can you rank these in order of importance.

Preferred Characteristics	Ranking

9. What are the prices?/throughout the year?

Does this differ by variety?

10 (i). Do you store sweet potato roots at the place of sale?

(ii) If no:

Are there reasons why you do not store?

(iii) If yes:

Where?

(iv) For how long?

(v) What type of damage (quality losses) do you experience, if any?

(vi) What effect does this have on the sale price?

(vii) Do you find that some varieties store better than others, and which?

(viii) What control measures do you use?

(ix) What do you do with the roots that have deteriorated?

12. (i) Do you sell processed sweet potato products?

(ii) If yes, which products?

(iii) How much do you sell?

13. (i) What type of customers buy processed products?

(ii) What qualities are sought for good processed products?

Product	Desired qualities

(iii) Do you buy the processed products, or process them yourself?

(iv) If you process yourself, are there some varieties which you prefer to process, and if so, which ones?

(v) What are the prices?/throughout the year?

Do these vary by variety?

14. (i) Do you store processed products?

(ii) If yes:Where?

(iii) For how long?

(iv) What type of damage (quality losses) do you experience, if any?

(v) Do you find that some varieties store better than others, which?

(vi) What control measures do you use?





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