

# SOP for Sensory Evaluation on Boiled Sweetpotato

Biophysical Characterization of Quality Traits, WP2

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Ethics: The activities, which led to the production of this manual, were assessed and approved by the CIRAD Ethics Committee (H2020 ethics self-assessment procedure). When relevant, samples were prepared according to good hygiene and manufacturing practices. When external participants were involved in an activity, they were priorly informed about the objective of the activity and explained that their participation was entirely voluntary, that they could stop the interview at any point and that their responses would be anonymous and securely stored by the research team for research purposes. Written consent (signature) was systematically sought from sensory panelists and from consumers participating in activities.

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## SOP: Sensory Evaluation on Boiled Sweetpotato

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**Recommendations of the focal point: the number of sensory attributes is high (26), so we recommend to reduce the number of samples to be evaluated per session.**

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# 1 SCOPE OF THE STUDY

## 1.1 Scope

The objective of the study is to establish a sensory profile of cultivars of sweetpotato prepared by steaming with a trained panel.

## 1.2 Prerequisite

The setting up and managing a sensory analysis tasting panel was explained in the deliverable: RTBfoods\_F.2.2\_2018.pdf

# 2 PRODUCT

## 2.1 Product Preparation in Laboratory conditions

### Step 1. Documentation

- Check the nature of the samples received and document the details of the samples in a sample logbook. These should include the sample name, date received, nature or type of packaging, and condition of the roots.

### Step 2. Sample preselection

- Select roots of average size, given the size range of the sample; they should be of about the same size and free from any visible damage in order to synchronize cooking time; the roots should also be of high integrity without any visible signs of damage or infection. Damage and infection could modify the sensory attributes of boiled sweetpotato.

### Step 3. Coding and labelling

- Assign a 3-digit sample code to each sample. Attach coded labels to the samples appropriately. Labelling at this stage blinds the people involved in preparation and contributes to minimising bias. Use and maintain these codes throughout the preparation process to label cooking pots and trays and also as dish codes when serving the panel.

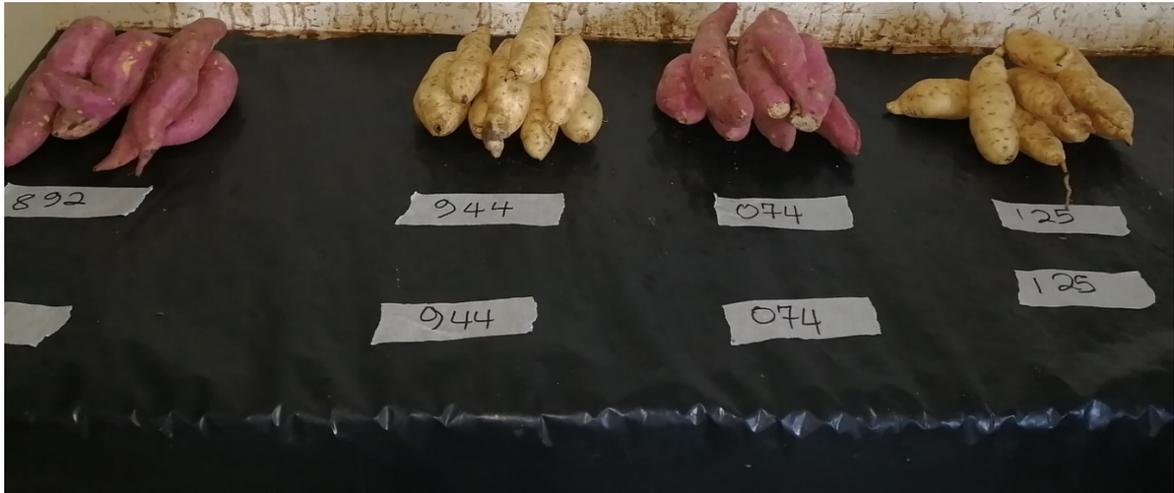


Figure 1. Coded samples after sample preselection

#### Step 4. Washing and second selection

- Wash the roots twice with clean water in a basin or saucepan (to remove any soil residue), and rinse under running water. If some of the sample is to undergo mineral analysis, rinse in distilled water.
- Select the roots of the highest integrity. They should have no visible physical damage due to corrosion or otherwise, pest and insect damage or rot. Use the freshest roots that have not softened. Select roots of about the same circumference to allow the same rate of cooking.

#### Step 5. Root length adjustment and final selection

- Mark off 7 cm on a plain white sheet of paper. Place the root on the paper ensuring that the middle part of the root lies between the marks. Cut off any extra ends of the root from either side to remain with a 7 cm portion from the mid-section. If the root is long, it might be possible to obtain two 7 cm portions from the same root.



Figure 2. Process of adjusting root length

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- Weigh the 7 cm portions of the roots on a weighing scale. Only use portions with weighing from 160 g to 240 g.

#### Step 6. Peeling

- Peel the 7 cm portions with a high-grade stainless steel or ceramic peeler. Peel carefully to ensure minimal loss of the flesh.
- The roots should be clean at this stage and not need washing. However, if necessary, wash them again to remove any existing dirt.

#### Step 7. Cooking

- Measure 2000 ml volume of water and transfer into the 24-diameter steaming pot
- Place a single layer of banana leaf at the bottom of the steaming pot. Place the roots upright on the banana leaf with the side of the proximal end in direct contact with the leaf. Cover the pan with a piece of banana leaf, and then the pan cover.



Figure 3. Process of preparing the cooking pot and placing the sample

- Place the cooking pan on heat and cook for an hour (from the time of putting the pan on fire). If preparing more than one sample, start cooking the next sample 15 minutes after the previous one.
- Put off the heat and remove the roots from the pan immediately to prevent further cooking
- Follow the procedure for sample presentation and service for guidance on how to present and serve sample to the panellists for sensory analysis

## 2.2 Sample storage conditions before tasting

This SOP is designed such that it is not necessary to store cooked samples before tasting. Samples are presented for tasting immediately they are cooked.

### 3 TASTING SEQUENCE

#### 3.1 General Information

##### Test Responsible Person/Group Animator

Mariam Nakitto, CIP-SSA, Uganda ( [m.nakitto@cgiar.org](mailto:m.nakitto@cgiar.org) )

##### Date/Time Phase of the test

The tests will be conducted between February and March, 2020. Sample tasting will take place between 10:00 hrs and midday EAT.

#### 3.2 Sample

##### Quantity of sample to be given to each panellist

Each panellist is presented with a disc (spherical) portion of about 2cm thickness.

##### Type of dish

The dish on which samples are served is a plastic disposable plate

##### Temperature of tasting

The samples are served at room temperature. Sensory evaluation takes 15 minutes per sample. Hence towards the end, when assessing texture, the temperature of the sample is expected to be at room temperature.

##### Repeated sample

One of the samples is repeated during each testing session to assess panel performance in terms of homogeneity and repeatability

##### Sample Codification: yet to be designed

<i>Sample Code</i>	<i>Replicate</i>	<i>Tasting Code</i>	<i>Cultivars</i>	<i>Tasting date</i>

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### 3.3 Service

#### Number of sample tasted by session

In each session 3 unique samples, with one served in duplicate will be tasted. This means a total of 4 samples will be tasted per session.

#### Type of service (ex: monadic,...)

Monadic

### 3.4 Panel

#### Number of panellists who participate in this study

We expect about 10 panellists

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### 3.5 Vocabulary

Type	Attributes	Definition	How to measure?	Scale
Odor	Sweetpotato	Odor of cooked sweetpotato	When you receive the sample, immediately open foil and take a whiff	0: odorless 1: barely noticeable 10: very strong
	caramel	Odor of caramel (molten sugar)		0: none 10: very strong
	Pumpkin	Odor of cooked pumpkin		0: none 10: very strong
	Off-odor	Atypical odor associated with transformation or deterioration of boiled sweetpotato		0: Absent 1: Present
Appearance	Orange colour intensity	Description of predominant color of sweetpotato and its relative intensity	Open foil, visually assess sweetpotato surface the surface and evaluate the orange color intensity, its homogeneity, translucency and fibrous appearance	0: white 1: cream 3: yellow 5: yellow-orange; 7: orange 10: deep orange
	Uniformity of color	Evenness of the distribution of the colour across entire sample surface		0: highly variable 10: consistent throughout
	Translucency	Attribute of object that allows light to pass through it but not images to be distinguished		0: Absent 1: Present
	Fibrous appearance	Geometrical attribute of product associated with presence of long string like particles		0: no visible fibres 10: extremely fibrous

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Type	Attributes	Definition	How to measure?	Scale
<b>Aroma</b>	Sweetpotato	Distinct aroma of cooked sweetpotato	Take a small piece of sample, chew slowly and take a whiff to score the intensity of the aromas you observe	0: none 10: very strong
	Pumpkin	Distinct aroma of cooked pumpkin		0: none 10: very strong
	Cooked carrot	Distinct aroma of cooked carrot		0: none 10: very strong
	Floral	Distinct aroma of flowers associated with poor quality boiled sweetpotato		0: none 10: very strong
<b>Taste</b>	Sweet	Basic taste produced by solutions of various substances such as sucrose	Take a small piece of sample, chew slowly and take a whiff to score the intensity of basic tastes you observe	0: not at all sweet 10: Extremely sweet
	Sour (=Acid)	Basic tastes produced by solutions of dilute aqueous solutions of acid substances including citric acid and tartaric acid		0: Not sour 1: Sour
	Bitter	Basic tastes produced by solutions of dilute aqueous solutions of various substances such as quinine and caffeine		0: Not bitter 1: Bitter

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Type	Attributes	Definition	How to measure?	Scale
Texture in mouth	Fracturability	Mechanical textural attribute related to the force necessary to break product into crumbs or pieces	Place sample between incisors and bite into it to assess the ease with which it breaks into distinct pieces or deforms	0:bends 10: highly fracturable
	Hardness in mouth	Mechanical textural attribute related to the force necessary to achieve a certain deformation	Place sample between molars and bite into it to access the amount of force required to bite into it	0: extremely soft 10: hard
	Crunchiness	Attribute of product to produce low pitched sound during rupturing	While you chew the sample observe the sound	0: Not crunchy 1: Crunchy
	Moisture (in the mass)	Textural attribute which describes amount of water present in the sample mass	While you chew, observe the degree of moistness of the sample mass	0: dry 10: extremely moist
	Adhessiveness	Textural attribute relating force required to remove material that adheres to the mouth or to a substrate	While you chew observe the extent to which the sample sticks to oral surfaces	0: none 10: very high
	Fibrousness	Geometrical attribute of product associated with presence of long string like particles	After chewing feel sample between tongue and palate to assess the amount of string like particles present on sample	0: none 10: very high
	Smoothness	Geometrical attribute associated with the overall degree of absence of particles within sample	After chewing feel sample between tongue and palate to assess the amount of string like particles present on sample	0: grainy 10: very smooth
	Rate of breakdown	Mechanical textural attribute related to length of time or number of chews required to masticate a product into a state ready for swallowing	Evaluate the number of chews required to masticate a product until you can swallow it	0: very slow 10: very fast

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Type	Attributes	Definition	How to measure?	Scale
<b>Texture</b> <b>by hand</b>	Moisture release	Textural attribute related to release of moisture from a product when pressure is applied	Take a piece of sample, press it between the fore finger and thumb and observe whether or not moisture is released from sample	0: Absent 1: Present
	Cohesiveness (moldability)	Textural attribute relating to degree to which a substance can be deformed before it breaks	Take a sizeable piece of sample and using all fingers attempt to make a ball with the sample	0: falls apart 10: moldable
	Mealiness	An attribute associated with gumminess characterized by powdery mouthfeel	Take a piece of sample and rub it between the fore finger and thumb and evaluate the ease with which it forms a powder	0: not mealy 10: extremely mealy
<b>Taste</b>	Sweet	Basic taste produced by solutions of various substances such as sucrose	Take a small piece of sample, chew slowly and take and score the intensity of basic tastes you observe	0: not at all sweet 10: Extremely sweet
	Sour (=Acid)	Basic tastes produced by solutions of dilute aqueous solutions of acid substances including citric acid and tartaric acid		0: Not sour 1: Sour
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### 3.6 Pictures to illustrate the tasting sessions



Picture 1: Panellists assessing samples in sensory booths



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