Sensory Characterization of Boiled Cassava

Biophysical Characterization of Quality Traits, WP2

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SOP: Sensory Characterization of Boiled Cassava		
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ABSTRACT

The sensory attributes of boiled cassava were mapped using quantitative descriptive analysis methodology. Nine samples that differed by the variety and planting age were evaluated by 13 trained panellists. After washing, the proximal and distal ends of the roots were cut off, then the remaining portion was peeled and cut into pieces of about 40 g and 5 cm depth. Thereafter, they were steam-cooked during 45 min. After cooking, the samples were stored in insulated containers for sensory analysis. In addition and in parallel, instrumental texture, colour and dry matter analyses were performed on a batch. Another batch of samples was dried at 50 °C for 24 h for future biochemical analyses. For sensory analysis, the samples were served at around 60 °C and each sample was tested in triplicate during three sessions on scales including three attributes of appearance, four attributes of texture by hand, two attributes of texture in mouth, one attribute of odour and three attributes of taste. The panellist immediately assesses the appearance attributes and thereafter, the texture while the temperature of the sample was around 40- 45 °C.

Keywords: Cassava, boiled cassava, preparation, quantitative descriptive analysis, colour texture,

1 SCOPE OF THE STUDY

1.1 Scope

The study aims to establish the sensory mapping of boiled cassava using QDA methodology

1.2 Prerequisite

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

2 PRODUCT: CASSAVA ROOT PREPARATION AND COOKING

2.1 Cassava preparation in Laboratory

1. Assign a 3-digit code to each variety. Attach coded labels to the samples appropriately for minimising bias. Use and maintain these 3-digit codes throughout the preparation process to label cooking pots and trays, and also as dish codes when serving the panel.

2. Select 2-3 cassava roots per variety, corresponding to approximately 4 kg

3. After washing, cut off the proximal and distal ends of the roots, thereafter, peel the remaining portion of the roots

4. Cut the peeled roots into pieces of about 40 g and 5 cm depth, wash and rinse them in tap water (photo 1)

Photo 1: Peeled and sliced cassava pieces

5. Introduce successively in the pan/pot, the tap water (approximately 2 L), support material (to avoid contact), and then cassava pieces (3 kg). Cover with polypropylene sheet (photo 2) before closing of the pot/pan by lid. Covering with polypropylene is a traditional use in Benin. Four batches were cooked in parallel during 45 min (photo 3).

Photo 2: Cassava pieces in pan/pot covered with polypropylene sheet

Photo 3: Cassava cooking batches

2.2 Sample storage after cooking

Samples are stored in insulated containers for sensory analysis, thereafter texture, colour and dry matter analyses in laboratory. A batch/part of samples is dried at 50 °C for 24 h for future analyses.

3 TASTING SEQUENCE

3.1 General Information

- **Date/Time Phase of the test**

The tests covered the period of 27/02/2020 to 06/03/2020, and were carried out each day from 10:00 to 11:00 a.m and from 12:00 to 13:00 p.m. The first session is devoted to the general information related to sensory analysis, the generation of attributes, the definition and techniques for evaluating sensory attributes. The two or three following sessions are used to train panellists for the use of

attributes and scales. Finally, the sensory test is performed when the accordance is established within and between panellists.

3.2 Samples distribution for tasting

- **Quantity of sample to be given to each panellist**

Each panellist received one piece of about 40 g at each session

- **Type of dish**

Each sample is served in a plastic plate with 3-digit codes

- **Temperature of tasting**

The samples are served at around 60 °C. The panellist immediately assesses the appearance attributes and thereafter, the texture. When assessing texture, the temperature of the sample is around 40- 45 °C. Sensory evaluation takes 10 minutes per sample

- **Repeated sample**

Each sample is tested in triplicate during three sessions.

- **Sample Codification**

Nine samples that differ by the variety and age (Table 1) were evaluated by the panel and they were randomized according to the codification aforementioned in section 2.1.

Table 1: Cassava roots evaluated

Varieties	Nb of samples	Age (month)
Dossi	2	9
		12
Agric	2	9
		12
Alanmandou	1	6
Koléhaomè	1	6
Atinwéwé	1	6
Hombété	1	8
Ofégué	1	8

3.3   Service

- **Number of sample tasted by session**

At each day, two sessions of 1 hour were carried out with a break of 1h. For a session, 4 samples are tasted.

- **Type of service (ex: monadic, …)**

The samples are served monadically (one after another), once they have been tasted by all the panellists.

3.4   Panel

- **Number of panellists who participate in this study**

13 trained panellists participate to the sessions

3.5 Vocabulary

Type	Attributes	Definition	How to measure?	Scale (mm)
Colour /appearance	White colour	Both inner and outer colour can range from light off-white to white (pure white)	Observe the surface of product and evaluate the intensity of each type of the colour and its homogeneity	0 : Off-white 100: Pure White
	Yellow colour	Yellowish to Yellow colour of product		0 : No Yellow 100 : Yellow
Aspect / appearance	Presence of stripe	Refers to the presence of the stripe on the surface of product	Observe the surface of product and evaluate the size and the number of stripe	0 : Absent 100 : Present
Texture by hand	Sticky	Property related to the adhesion of the product between the fingers	Press the product between the fingers and assess the ease of the product to come off the upper finger or to adhere to fingers	0 : No sticky 100 : Sticky
	Hard to break/cut	Force required to cut/break with hand	Crush the product between fingers and assess the ease of breaking	0 : Ease to cut 100 : Difficult to cut
	Crumbly	Property of the product to crumble between the fingers	Crush the product between two fingers and assess the ease of crumbliness	0 : No crumbly 100 : Crumbly
	Presence of fibers	Refers to the presence of fine fibers visible to the eye	After breaking / cutting, breaking / crumbling, evaluate the presence/intensity of fine fibers visible to the eye	0 : No fiber 100 : Fibers
Texture in mouth	Granular	Refers to the presence of small grains during chewing	Put the product and mash/crush it between the molars to assess the presence of small grains on the tongue	0 : No granular 100 : Granular
	Easy to chew	Property related to the number of chews necessary to swallow the product	Put the product between the molars and mash it to assess the number of chews before swallowing	0 : Difficult 100 : Easy
Odour	Cassava odour	Odour of boiled cassava	Take a whiff and evaluate the intensity of cassava odour	0 : Low 100 : High

Type	Attributes	Definition	How to measure?	Scale (mm)
Taste	Sweet/ sugary	Basic light sugary taste like a little glucose or sucrose in water solution	Put a part of the sample in the mouth and on the tongue; then evaluate the intensity of sugary taste	0 : Neutral/Absent 100 : Sweet
	Bitter	Basic bitter taste like small quantity of quinine or caffeine in water	Put a part of the sample in the mouth and on the tongue, and then evaluate the intensity of bitterness	0 : Neutral/Absent 100 : Bitter
	Bitter aftertaste	During chewing, bitter taste after swallowing, eg there is a light bitter aftertaste	After swallowing, observe the feeling/sensation of the bitter taste on the tongue and assess its intensity	0 : Absent 100 : Present

3.6 Pictures to illustrate the tasting sessions

a) Vocabulary Generation

b) Sensory tasting

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