Laboratory Standard Operating Procedure

Sensory Characterization of Pounded Yam

Biophysical Characterization of Quality Traits, WP2

Iwo, Nigeria, August 2020

Bolanle OTEGBAYO, Bowen University, Iwo, Nigeria

Abiola TANIMOLA, Bowen University, Iwo, Nigeria

Oluyinka ORONIRAN, Bowen University, Iwo, Nigeria

Isabelle MARAVAL, Centre de coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), Montpellier, France (Validator)

Nelly FORESTIER-CHIRON, CIRAD, Montpellier, France (Validator)

Christophe BUGAUD, CIRAD, Montpellier, France (Validator)

www.rtbfoods.cirad.fr

This report has been written in the framework of RTBfoods project.

Image cover page © LAJOUS P. for RTBfoods.

RTBfoods

WP2: *Biophysical Characterization of Quality Traits*

SOP: Sensory Characterization of Pounded Yam

Date: 18/08/2020	Release: 1

Written by: Bolanle OTEGBAYO, Abiola TANIMOLA, Oroniran OLUYINKA

For information on this SOP please contact:

- Bolanle OTEGBAYO, botegbayo@yahoo.co.uk
- Christophe BUGAUD, (RTBfoods Focal Point for Sensory Analysis), Christophe.bugaud@cirad.fr

This document has been reviewed by:

Christophe BUGAUD	24/11/2020
Nelly FORESTIER-CHIRON	24/11/2020
Isabelle MARAVAL	24/11/2020

Final validation by:

Christophe BUGAUD (CIRAD)	24/11/2020

CONTENTS

Table of Content

ABSTRACT

Sensory analysis is a scientific method used to evoke, measure, analyze and interpret those responses to products as perceived through the senses of sight, smell, touch, taste, and hearing. Pounded yam is a glutinous dough made by peeling, boiling, pounding and kneading of yam tubers. Standard Operation procedure (SOP) is important for sensory evaluation of pounded yam to minimize variation and produce consistent result as much as possible during the step- by- step preparation and subsequent sensory analysis. The objective of this SOP was to develop and establish a sensory profile for pounded yam prepared from species or varieties of yam tubers using trained panellists. Pounded yam was prepared by means of a mechanical yam pounder. Descriptive sensory evaluation method that was employed involved the use of extensively trained panellists and food descriptors from local foods which were used to exemplify or describe the intensity of sensory attributes in pounded yam.

The trained panellists identified colour (appearance) smoothness, mouldability, stretchability, hardness, stickiness and cohesiveness (which are textural attributes) as important sensory characteristics in pounded yam. Standard rating scales were developed from the local food descriptors; these were used to evaluate the intensity of these sensory characteristics in pounded yam. This SOP thus provides step-by step objective evaluation of these sensory characteristics in pounded yam.

Key words: Pounded yam, Trained Panellists, Descriptors, Colour, Mouldability, Stretchability, Stickiness, Cohesiveness, hardness.

1 SCOPE OF THE STUDY

1.1 Scope

The objective of this SOP is to develop and establish a sensory profile for pounded yam prepared from species/ varieties of yam tubers using trained panellists.

1.2 Prerequisite

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

2 PRODUCT

2.1 Product Preparation in Laboratory conditions

Step 1: Peeling

- Put the tubers in a longitudinal position and peel from proximal (head) position to the distal (bottom) position (see picture).

- Peel-off the brown skin, remove all the hairs, spots e.t.c that can be on the flesh of the tuber.

- Cut off the proximal (the tip of the tuber) and the distal portion (the portion where the vine grows from).

- Slice the remaining part of the tuber and cut to a thickness of 20 mm by 20 mm

- Weigh about 450 g of the diced yam.

- Rinse the diced yam thoroughly with portable water.

Fig 1: a: Raw yam tubers   b: Peeling of the tuber   c):   Diced raw yam

Step 2: Boiling

- The diced yam was cooked in the cooking regime of a yam pounder (model sd-900Y, National Electronic Co Ltd, Japan) (Fig 2a).

- 250 ml of water was measured into the steam cup (fig 2b) and tank packing of the yam pounder. The bowl and the pounding blade were then assembled and the weighed yam cubes were poured inside and covered with the lid

- The yam pounder was then switched 'on' to the cooking regime. When cooking is completed, the alarm will sound (after approximately 20– 22 minutes).

Fig 2 : a) Yam pounder

b) Steam Cup of Yam pounder

c)   Diced yam in the bowl of the pounder

d) cooked yam

Step 3: Pounding

- When cooking was completed the yam, pounder was switched to the pounding regime (fig 3)

- Pound for a total period of 4 minutes, with intermittent stopping after the first 2 minutes and then 1 minute later, to bring together the scattered yam pieces (using a plastic spoon) for homogenous pounding.

- When pounding is finished (68 $^{\circ}$C), switch "OFF", detach the bowl by turning to left, and take out the yam and pounding blade.
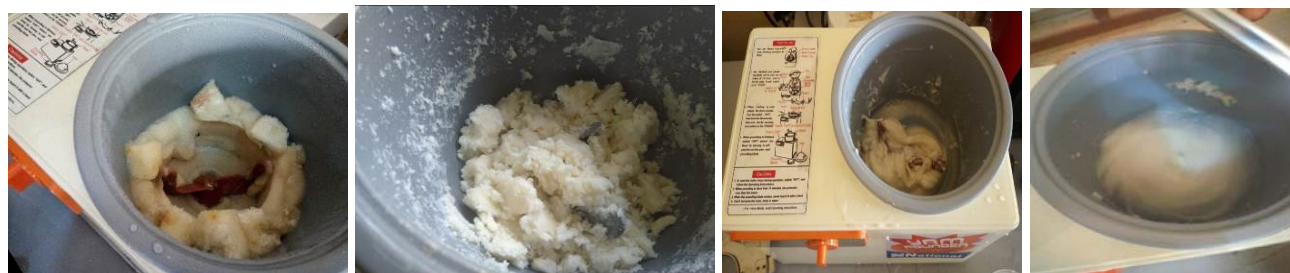
(a)　　　　　　　　(b)　　　　　　　　(c)　　　　　　　　(d)

Fig 3 : (a) Mashing of boiled yam

(b) Further mashing of boiled yam

(c) Kneading of boiled yam to form a dough

(d). Pounded yam

Step 4: Packing

- The pounded yam was cut into small balls (10g) with spoon and wrapped in Aluminum foil for sensory texture profile analysis (STPA) and in small plastic moulds for Instrumental texture profile analysis (ITPA)(Fig 4a &b))

- The packing of the pounded yam samples into about 24 balls may take approximately 3 1/2 minutes per individual (7 minutes when handled by 2 people)

- The temperature of pounded yam immediately after pounding was about 68°C. This may fall to between 45 – 55 ^{o}C while wrapping in preparation for sensory analysis or instrumental textural analysis.

- The pounded yam was kept at a temperature of 45 – 50 ^{o}C before analysis by putting it in Styrofoam box or a lunch box (this can be connected to electricity to keep sample temperature constant prior to evaluation) (Fig 4c & d).

Step 5: Coding and labelling:

- A 3-digit codes was assigned to each sample. Labelling at this stage blinds the people involved in preparation and contributes to minimising bias. These codes were maintained throughout the preparation process and analysis of the products. See Plate

(a)

(b)

(c)

(d)

(e)

Fig 4:

a) Pounded yam samples in plastic moulds (for instrumental texture analysis)

b) Pounded yam samples in aluminium foil (for sensory analysis)

c) Lunch box/bowl to keep temperature of samples constant

d) Samples inside the Lunch box/bowl

e) 3-digit coded samples for presentation to panellists

2.2   Sample storage conditions

The samples were kept in a Styrofoam box or lunch box to keep at a temperature between 45-50 ^{O}C till sensory evaluation session.

3 TASTING SEQUENCE

3.1 General Information

3.1.1 Test Responsible Person

Abiola TANIMOLA, email: oladeleabiola12@gmail.com

3.1.2 Date/Time Phase of the test

The test was done between 12:00 noon and 1:00pm on 24th of March, 2020 (This is the official break time, when panellists can be available)

3.2 Sample

3.2.1 Quantity of sample to be given to each panellist

Each panellist was presented with six samples each, each sample weighed 10-15g

3.2.2 Type of dish

Samples were presented in white plastic plates

3.2.3 Temperature of tasting

Tasting temperature was between **45 – 50 ⁰C**

3.2.4 Repeated sample

Each sample was presented in duplicate with different three digit codes

3.2.5 Sample Codification

Codes will be alloted to the samples as sensory evaluation is being conducted

Sample Code	*Replicate*	*Tasting Code*	*Cultivars*	*Tasting date*

3.3 Service

3.3.1 Number of samples tested by session

Six samples were presented to the panellists per session. The six samples consist of three varieties presented in duplicates.

3.3.2 Type of service (ex: monadic, …)

Monadic (samples will be served one after the other, to maintain the sample temperature)

3.4 Panel

3.4.1 Number of panellists who participate in this study

The panel is made up of 15 trained members. An 8-10 member per session will be acceptable.

3.5   Vocabulary

| Type	Attributes	Definition	How to measure?	Scale
Visual aspect	Colour white	The degree of whiteness of the pounded yam sample like a plain white paper or white flip chart/colour of boiled egg albumen.	Visually inspect sample surface	1: white 2 : Off- white 3 : Grey 4 : Light grey 5 : Cream 6 : Light yellow 7 : Yellow 8 : Light brown 9 : Brown
	Colour off-white	Colour of the pounded yam comparable to that of Soymilk or "Eba" from white "Gaari"	Visually inspect sample surface	
	Colour grey	Colour of Pounded yam comparable to that of greyness covering a boiled egg yolk	Visually inspect sample surface	
	Colour light grey	Colour of pounded yam	Visually inspect sample surface	
	Colour cream	Colour of Pounded yam comparable to that of evaporated liquid milk such as Peak milk	Visually inspect sample surface	
	Colour light yellow	Colour of pounded yam comparable to boiled egg yolk that is light in colour	Visually inspect sample surface	
	Colour yellow	Colour of Pounded yam comparable to deep colour of Yellow maize	Visually inspect sample surface	
	Colour light brown	Colour of Pounded yam comparable to the colour whole wheat meal	Visually inspect sample surface	
	Colour brown	Colour of Pounded yam comparable to the colour of carton paper	Visually inspect sample surface	
Texture by hand	Stretchability	Ability of pounded yam to stretch when pulled apart with fingers	The pounded yam is touched and pulled apart with the fingers	0: Not stretchable 5: Medium stretchability 10 : Very stretchable
	Mouldability/Cohesiveness	Ability of the pounded yam to stick together easily without disintegrating or cohesive and being easy to mould.	Sample is put in the hands and moulded	0: Not mouldable 5: Medium mouldability 10: Mouldable
	Stickiness	This is when the pounded yam sticks or adhere to the fingers when it is touched with fingers or during moulding into bolus for swallowing.	Sample is touched with fingers or moulded in the hands	0: Not sticky 5: Medium Stickiness 10: Very sticky

Type	Attributes	Definition	How to measure?	Scale
Texture by hand	Hardness	Softness is when it is quite easy to compress the sample, while hardness is when force is used to compress the sample or takes effort to compress the sample	Sample is pressed with the index finger	0: Very soft 10: Very hard
	Smoothness	Absence of lumps	Sample is pressed firmly between the fingers	0: Big lumps 10: absence of lumps

3.6   Pictures to illustrate the tasting sessions

3.7   Sensory evaluation training-in-session
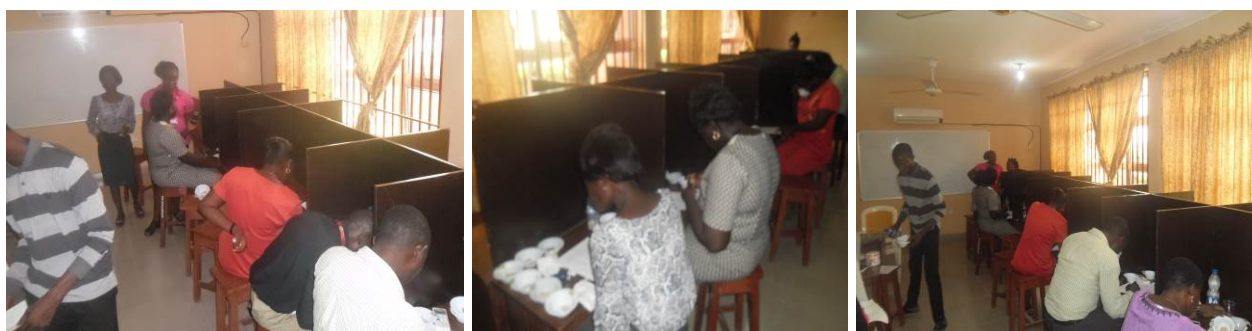
Sensory evaluation session

Credits for each Picture.

Bolanle Otegbayo

Abiola Tanimola

Oroniran Oluyinka

Institute:	Cirad – UMR QualiSud
Address:	C/O Cathy Méjean, TA-B95/15 - 73 rue Jean-François Breton - 34398 Montpellier Cedex 5 - France
Tel:	+33 4 67 61 44 31
Email:	rtbfoodspmu@cirad.fr
Website:	https://rtbfoods.cirad.fr/