



African Food Tradition rEvisited by Research
FP7 n°245025

Start date of project: **01/09/2010**

Duration: **45 months**

Deliverable number: D.1.2.3.2

Title of deliverable: SOP for sensory physical chemical and textural analysis for Group 2

Deliverable type (Report, Prototype, Demonstration, Other): Report

Contractual date of delivery: February 2011

Actual date of delivery: October 2011

Work-package contributing to the deliverable: WP1

Organisation name of lead contractor for this deliverable: ADIV

Authors: are indicated on the appropriate SOPs.

This document has been send to:

The coordinator by WP Leader	Date: September 2011
To the Commission by the Coordinator	Date: October 2011

* PU: Public; PP: Restricted to other programme participants (including the Commission Services); RE: Restricted to a group specified by the consortium (including the Commission Services); CO: Confidential, only for members of the consortium (including the Commission Services)

Methodology for the development of SOPs for this deliverable.

This deliverable consists of several SOPs. SOPs related to sensory physical chemical and textural analysis for one Group of product.

The SOP's come from four sources:

1. The literature by searching the analysis method for similar components we want to determine in the African fermented and functional products. In this case several articles are combined according to their precisions.
2. Standards from the international Organization Standardization (ISO) or AACC the International Approved methods. In this case, the method is used like that or after minor modifications. And the modifications are then precised in the document, with the ISO or AACC joined in the annex. To be in agreement with intellectual property rules the project coordination purchased and distributed to partners all the standards referenced in SOP
3. The SOP's can come from the laboratory that developed the methods for the specific analysis.
4. Case of the kit enzymatic method developed by the vendors of the kit materials.

After writing, the SOP's are approved by the Work Package Leader (WPL) related to the group of product concerned (Group 1: WP2; Group 2: WP3; Group 3: WP4).



The WPL is in charge to send the SOP's to the concerned partners for validation. Each partner, according to his laboratory facilities, validates the method and informs one of the following alternatives in his laboratory:

- R - The laboratory makes the analysis in routine (= R codification in the table joined)
- P - The laboratory is able to make this analysis (= possible P)
- B - The laboratory can make the analysis after buying equipment (= B)
- I - The laboratory can't make the analysis (I= impossible or sub-contracting).

The WPL decides the end of the validation step. He accepts the final SOP version. He completes the table with the last revision date.

D 1.2.3.2 - SOPs for physical and textural analysis for Group2

Characteristics	Compounds	Method	Principle	N° SOP
Physical characteristics	colour	Lab	Measurement by Minolta chrometer	Phys-MeatFish-001-en
	texture	TPA	Texture profil analysis with texturometer	Phys-MeatFish-002-en
	texture	shear force measurements	Warner Bratzler shear force measurement	Phys-MeatFish-003-en

	<p><u>African Food Tradition rEvisited by Research</u></p> <p><u>FP7 n°245025</u></p>	
<p>Deliverable D.1.2.3.2 : SOP for sensory, physical and textural analysis for Group 2</p>		
<p>Procedure for color measurement</p>		
<p>SOP Number: Phys-MeatFish-001-en</p>		
<p>Date of creation: ...18/05/2011.....</p>	<p>Revision:</p>	
<p>Written by : Emilie PARAFITA (ADIV)</p> <p>For information on this SOP please contact :</p> <ul style="list-style-type: none"> • Emilie PARAFITA (ADIV) • 		
<p>This document has been approved by :</p>		
<p>Partner</p>	<p>Name of the person who approved</p>	<p>Date</p> <p>DD/MM/YY</p>
<p>CIRAD</p> <p>UAC</p> <p>CSIR</p> <p>ADIV</p> <p>UCAD</p> <p>INRA</p>	<p>Emilie PARAFITA, Valérie SCISLOWSKI</p>	<p>09/09/2011</p>

Colour measurement

SOP Number: **Phys-MeatFish-001-en**

Date of creation: 23/5/2011

Date of revision:

Table of contents

1	Scope and application	3
2	References	3
3	Définitions	3
4	Principle	3
5	Reagents	3
6	Apparatus	3
7	Procedure	4
8	Expression of résultats	4
8.1	Method of calculation and formulae	4
8.1.1	<i>Calculation</i>	4
8.1.2	<i>Formulae</i>	4
8.2	Repeatability	4
9	Critical points or Note on the procedure	4
10	Test report	5
11	Revision record	5
12	Appendix	5

Colour measurement

SOP Number: **Phys-MeatFish-001-en**

Date of creation: 23/5/2011

Date of revision:

1 SCOPE AND APPLICATION

This procedure can be applied to fermented salted meat (kizota).

2 REFERENCES

3 DÉFINITIONS

4 PRINCIPLE

According the basic principle of colorimetry, all colors can be represented as a three-dimensional color space, where each color is defined by three independent parameters. A colorimetric notation includes three numbers, or coordinates, which are used to locate a color in a specific model of color space, and serves as its address or description. There are different color spaces; the CIE 1976 (L*,a*, b*) or CIELAB system is the most used to characterize the meat colour.

5 REAGENTS

6 APPARATUS

Colorimeter model = MINOLTA- CR/DP 400

The illuminant is C/D65.

Illuminating/viewing system: d/0 (diffuse illumination/0° viewing angle; specular component included) (compliant with JIS Z 8722; including regular reflectance)

Measurement/illumination area: Φ 8mm/ Φ 11mm

Colour measurement

SOP Number: **Phys-MeatFish-001-en**

Date of creation: 23/5/2011

Date of revision:

7 PROCEDURE

Before each measurement, a calibration with a spectralon is carried out.

The colour space selected is: space L^* , a^* , b^* .

The focus is positioned on the sample. The diameter of integrating sphere must to be less or equal to the size of sample surface.

Three flashes are necessary to each measurement. They are performed automatically by the colorimeter.

A minimum of 3 repetitions of measurement are required by sample

8 EXPRESSION OF RESULTS

L^* represents the difference between light (where $L^*=100$) and dark (where $L^*=0$).

a^* represents the difference between green ($-a^*$) and red ($+a^*$)

b^* represents the difference between yellow ($+b^*$) and blue ($-b^*$).

8.1 Method of calculation and formulae

8.1.1 Calculation

8.1.2 Formulae

8.2 Repeatability

9 CRITICAL POINTS OR NOTE ON THE PROCEDURE

The comparison of color between several samples is possible only if the measurement have been performed with the same colorimetric device and in the same experimental conditions. Each measurement has to be performed in the same conditions. The freezing may have a deleterious effect on color.

Colour measurement

SOP Number: **Phys-MeatFish-001-en**

Date of creation: 23/5/2011

Date of revision:

10 TEST REPORT



The test report shall indicate the value of each parameter of color measurement (L, a* and b*). In addition, it shall mention experimental conditions (colorimetric device, T°C of sample, storage conditions of sample, etc...).

The test report shall include all details necessary for the complete identification of the sample.

11 REVISION RECORD

Date	Responsible person	Description of change

12 APPENDIX

	<p><u>African Food Tradition rEvisited by Research</u></p> <p><u>FP7 n°245025</u></p>	
<p>Deliverable D.1.2.3.2 : SOP for sensory, thysical and Textural analysis for Group 2</p>		
<p>Procedure for TPA analysis</p>		
<p>SOP Number: Phys-MeatFish-002-en</p>		
<p>Date of creation: 20 mai 2011</p>	<p>Revision:</p>	
<p>Written by : Emilie PARAFITA (ADIV)</p> <p>For information on this SOP please contact :</p> <ul style="list-style-type: none"> • Emilie PARAFITA (ADIV) • 		
<p>This document has been approved by :</p>		
<p>Partner</p>	<p>Name of the person who approved</p>	<p>Date</p> <p>DD/MM/YY</p>
<p>CIRAD UAC CSIR ADIV UT UCAD INRA</p>	<p>Emilie PARAFITA, Valérie SCISLOWSKI</p>	<p>07/09/2011</p>

TPA analysis

SOP Number: **Phys-MeatFish-002-en**

Date of creation: 23/5/2011

Date of revision:

Table of contents

1	Scope and application	3
2	References	3
3	Definitions.....	3
4	Principle	4
5	Reagents	4
6	Apparatus.....	4
7	Procedure.....	4
8	Expression of résultats.....	4
8.1	Method of calculation and formulae	4
8.2	Repeatability.....	5
9	Critical points or Note on the procedure.....	6
10	Test report	6
11	Revision record.....	6
12	Appendix.....	6

TPA analysis

SOP Number: **Phys-MeatFish-002-en**

Date of creation: 23/5/2011

Date of revision:

1 SCOPE AND APPLICATION

This procedure can be applied to fermented salted fish and meat (Lanhouin, kizota, kong).

2 REFERENCES

- Bourne, M.C. 1982. Principles of objective texture measurement. In Food Texture and Viscosity: Concept and Measurement, pp. 114-117. Academic Press, San Diego.
- Bourne MC , 2002- Food Texture and Viscosity (Second Edition) : Concept and Measurement - Academic Press Inc- collection Food Science and Technology- 416 p
- Friedman, H.H., Whitney, J.E., and Szczesniak, A.S.1963. The Texturometer – A new instrument for objective texture measurement. J. Food Sci. 28:390-396.

3 DEFINITIONS

TPA= Texture Profil Analysis

Hardness = it is the peak force of the first compression of the product.

The Fracturability point = it occurs when the plot has its first significant peak (where the force falls off) during the probe's first compression of the product.

Cohesiveness = it is how well the product withstands a second deformation relative to how it behaved under the first deformation. It is measured as the area of work during the second compression divided by the area of work during the first compression.

Springiness = it is how well a product physically springs back after it has been deformed during the first compression.

TPA analysis

SOP Number: **Phys-MeatFish-002-en**

Date of creation: 23/5/2011

Date of revision:

4 PRINCIPLE

Texture Profile Analysis (TPA) principles are applied to carefully prepared samples taken from each samples. Each sample has to be compressed twice enabling determination of key properties by comparing the load profiles of both peaks.

5 REAGENTS

6 APPARATUS

Texturometer TAXT + with logiciel Expoment.

7 PROCEDURE

Speed: 1 mm/sec

Measurements in Newton

Samples 1 cm thick

Sample must to be cut in the same direction of the fibers

A sample of food of standard size and shape is placed on the base plate and compressed and decompressed two times by a platen attached to the drive system (*Malcolm C. Bourne, 2002*).

8 EXPRESSION OF RESULTS

8.1 Method of calculation and formulae

Several parameters are calculated from the texture profile (see graph 1):

TPA analysis

SOP Number: **Phys-MeatFish-002-en**

Date of creation: 23/5/2011

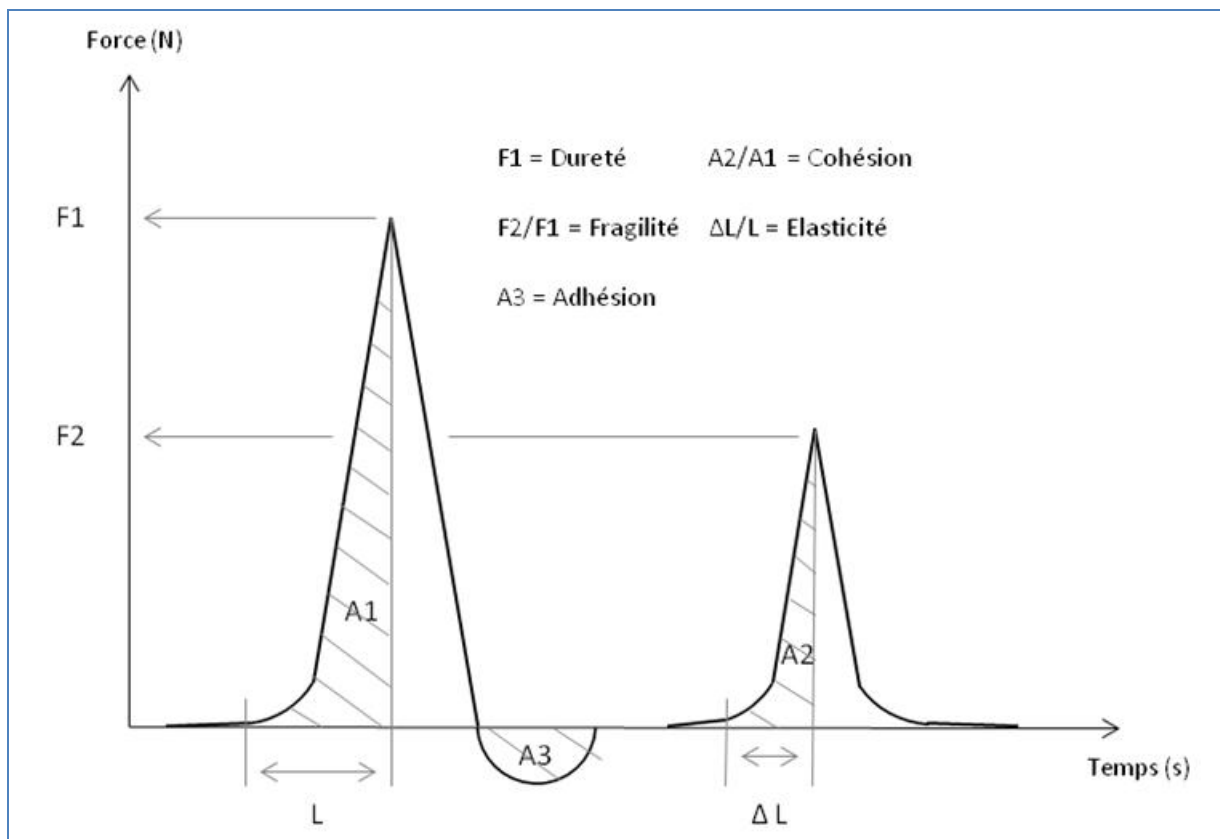
Date of revision:

Fracturability = $F2/F1$

Cohesiveness = $A2/A1$

Adhesiveness = $A3$

Springiness = $\Delta L/L$



Graph 1: Texture Profile

8.2 Repeatability

Ten repetitions are necessary for each sample.

TPA analysis

SOP Number: **Phys-MeatFish-002-en**

Date of creation: 23/5/2011

Date of revision:

9 CRITICAL POINTS OR NOTE ON THE PROCEDURE

The comparison of TPA value between several samples is possible only if the measurement have been performed with the same texturometer and in the same experimental conditions. Each measurement has to be performed in the same conditions. The freezing may have a deleterious effect on texture of products.

The post-test speed must be the same as the test speed so that both compressions are plotted under identical circumstances, and the area integrations are fully comparable

10 TEST REPORT

The test report shall indicate the value of each parameter of TPA. In addition, it shall mention experimental conditions (TPA device, T°C of sample, storage conditions of sample, etc...).

The test report shall include all details necessary for the complete identification of the sample.

11 REVISION RECORD

Date	Responsible person	Description of change

12 APPENDIX



	<p><u>African Food Tradition rEvisited by Research</u></p> <p><u>FP7 n°245025</u></p>	
<p>Deliverable D.1.2.3.2 : SOP for sensory, physical and textural analysis for Group 2</p>		
<p>Procedure for Warner Bratzler shear force test</p>		
<p>SOP Number: Phys-MeatFish-003-en</p>		
<p>Date of creation: 19 mai 2011</p>	<p>Revision:</p>	
<p>Written by : Emilie PARAFITA (ADIV)</p> <p>For information on this SOP please contact :</p> <ul style="list-style-type: none"> • Emilie PARAFITA (ADIV) • 		
<p>This document has been approved by :</p>		
<p>Partner</p>	<p>Name of the person who approved</p>	<p>Date</p> <p>DD/MM/YY</p>
<p>CIRAD</p> <p>UAC</p> <p>CSIR</p> <p>ADIV</p> <p>UT</p> <p>UCAD</p> <p>INRA</p>	<p>Valérie Scislowski</p>	<p>05/09/11</p>

Table of contents

1	Scope and application	3
2	References	3
3	Définitions	3
4	Principle	3
5	Apparatus.....	3
6	Procedure.....	3
7	Expression of résultats.....	4
7.1	Method of calculation and formulae	4
7.1.1	<i>Calculation.....</i>	<i>4</i>
7.1.2	<i>Formulae.....</i>	<i>4</i>
7.2	Repeatability.....	4
8	Critical points or Note on the procedure.....	4
9	Test report.....	4
10	Revision record.....	5
11	Appendix.....	5

1 SCOPE AND APPLICATION

This procedure can be applied to fermented salted fish and meat (Lanhouin, kizota, kong).

2 REFERENCES

Honikel Karl O. (1998) Reference Methods for the assessment of physical Characteristics of meat. Meat Science, 49, 447-457.

3 DEFINITIONS

4 PRINCIPLE

The Warner-Bratzler shear test produces a cutting shear action through the sample. The force required to do this relates to the toughness of the sample. The force range for most meats is 20 N to 100 N.

5 APPARATUS

Texturometer TAXT + with logiciel Expoment.

6 PROCEDURE

The procedure is described by Honikel (1998).

Speed: 1 mm/sec

Measurements in Newton

Samples 1 cm x 1 cm thick

The measures must be realized perpendicular to the direction of fibers.

7 EXPRESSION OF RESULTS

7.1 Method of calculation and formulae

7.1.1 Calculation

The parameters to be measured from the force deformation curve are the peak force and the total energy (Honikel, 1998). The force is expressed in Newton.

7.1.2 Formulae

7.2 Repeatability

Ten repetitions are necessary for each sample.

8 CRITICAL POINTS OR NOTE ON THE PROCEDURE

The comparison of Warner Bratzler shear force value between several samples is possible only if the measurement have been performed with the same texturometer and the same blade in the same experimental conditions. Each measurement has to be performed in the same conditions. The freezing may have a deleterious effect on texture of products.

9 TEST REPORT

The test report shall indicate the value of each parameter of TPA. In addition, it shall mention experimental conditions (texturometer device, T°C of sample, storage conditions of sample, etc...).

The test report shall include all details necessary for the complete identification of the sample.

Warner Bratzler shear force test

SOP Number: **Phys-MeatFish-003-en**

Date of creation: 23/5/2011

Date of revision:

10 REVISION RECORD

Date	Responsible person	Description of change

11 APPENDIX