

Determination of relevant sensory properties of pounded yams (*Dioscorea* spp.) using a locally based descriptive analysis methodology

C. Nindjin^{a,b,*}, D. Otokoré^c, S. Hauser^d, A. Tschannen^b, Z. Farah^d, O. Girardin^e

^a UFR STA, Université d'Abobo-Adjamé, BP 801, Abidjan 02, Côte d'Ivoire

^b Centre Suisse de Recherches Scientifiques, BP 1303, Abidjan 01, Côte d'Ivoire

^c UFR Biosciences, Université de Cocody, BP V582, Abidjan 22, Côte d'Ivoire

^d Department of Food Science, Swiss Federal Institute of Technology, ETH-Z, CH-8092, Zürich, Switzerland

^e Fondation Rurale Interjurassienne (Courtemelon loveresse), Case postale 65-2852 Courtételle, Switzerland

Received 25 May 2004; received in revised form 8 May 2006; accepted 16 May 2006

Available online 7 July 2006

Abstract

A panel of adult village dwellers was trained in descriptive analysis method using a local language of whom panellists are familiar to describe the properties of a popular pounded yam (*Dioscorea* spp.), called “foutou”. The different samples of “foutou” were made from four major varieties of two species of yam (*Dioscorea cayenensis-rotundata* and *Dioscorea alata*) and an industrially prepared yam product called Bonfoutou®. In all, 21 attributes were identified, 9 of which were used for profiling. Lumpiness and springiness of the mass varied markedly with species. Greyish colour, fibre content, “easiness to mould” and sweetness differed among the varieties. Preferences were tested by a group of traditional yam consumers. “foutou” made from *D. cayenensis-rotundata* was preferred due to textural attributes. “foutou” made from *D. alata* was disliked. “Easiness to mould” and springiness appeared relevant to general preference for pounded yam and lumpiness contributed to explain “foutou” aversion. The study showed a list of determining attributes that could be used to describe pounded yam. It showed also that descriptive test was a suitable method of sensory analysis, which could be used outside the laboratory, under real conditions conforming to traditional patterns of eating and of a West-African food.

© 2006 Elsevier Ltd. All rights reserved.

Keywords: *Dioscorea* spp.; Descriptive analysis; Preference; Yam; Côte d'Ivoire

1. Introduction

Yam (*Dioscorea* spp.) tubers are one of the staple foods of West Africa. To increase the availability and the potentialities in the use of yam tubers, several investigations have been carried out. These studies especially concerned the agronomic potential of yam varieties (Pistorius, 1992), the intensive farming systems (Olojede, Ohiri, & Chukwu,

2001), the techniques for reducing tubers post-harvest losses under fresh (Tschannen et al., 2002) and dried forms (Akissoe et al., 2001), and the characterizations of physico-chemical and functional properties of yam tubers (Otegbayo, Aina, Asiedu, & Bokanga, 2005). Few data (Egesi, Asiedu, Egunjobi, & Bokanga, 2003; Onayemi, 1985) exist on the perception of the quality of processed yam using analytical tools, allowing to generate an extended array of sensory descriptors, responsible for consumers preference. When an analytical method was used as sensory texture profile technique (Onayemi, 1985), the attributes developed were not sufficiently defined as relevant for the expectations of the quality yam by consumers. Even when it is the case (Egesi et al., 2003), the attributes used, were

* Corresponding author. Address: UFR STA, Université d'Abobo-Adjamé, BP 801, Abidjan 02, Côte d'Ivoire. Tel.: +225 234 727 90; fax: +225 234 512 11.

E-mail address: charlemagne.nindjin@csrs.ci (C. Nindjin).

not generated by panellists, at the risk of not determining exhaustively and not appreciating the quality criteria expected by the consumers in relation with the traditional pattern of eating and lifestyle. Thus, it is necessary to use an everyday language and defining that language locally enables one to fully capture perceptions without imposing external standards that will be inconsistent with that culture. To do that, Stone and Sidel (1998) suggested the use of descriptive analysis methodology. In this process, it has been demonstrated that consumers are capable of describing their perceptions and are able to reach an agreement through interactive discussion as to what set of words they will use to represent all the sensations they experience (Stone & Sidel, 1998).

The present study aimed to improve consumer-focused knowledge about the factors of quality that determine preference of yam. This work aimed therefore to develop a list of sensory criteria, to compare sensory properties of yams, and to explain the preference of consumers. In order to define best the criteria of quality, this work was carried out with people who are familiar with yam in Côte d'Ivoire and in an environment where of yam consumption is common. A particularly frequent and widespread preparation of yam is pounded yam, termed "foutou" in Côte d'Ivoire, or "fufu" in Ghana. Traditionally, boiled tubers of yam are pounded in a wooden mortar with a wooden pestle, until a stiff glutinous dough is formed. For consumption, a bite-size portion is cut off with the fingers, moulded into spherical mass and rather chewed depending on its gumminess or directly swallowed, accompanied by a sauce. The study has been limited to pounded yam, because this form is most popular in Côte d'Ivoire and many other West-African countries as Nigeria and Ghana (Anonymous, 2002).

2. Materials and methods

2.1. Study location

Bringakro, a rural village located in the centre of Côte d'Ivoire, about 180 km northwest of Abidjan (N6.401°, W5.091°), was the site of the sensory analysis and preference test. The population of this village is essentially composed of the ethnic group Baoulé, which is renowned for its tradition of yam culture in Côte d'Ivoire, including year round consumption of yam, particularly in rural zone (Serpantie, 1983). These people are accustomed to appraise yam tubers.

2.2. Samples

Four varieties of yam belonging to two species, harvested and stored in the village for the purpose of an already published study (Girardin et al., 1998) were used for the sensory analyses and preference test: Krenglè and Lokpa (*D. cayenensis-rotundata*) as well as Bètè bètè and Florido (*D. alata*). Tubers were used at the end of a 6 months storage period. These varieties are generally stored

by farmers in Côte d'Ivoire during this period (Girardin, 1996) and they make up the bulk of commercialised yam in this country. In addition, an instant "foutou" made from yam flakes, produced by Novalim-Nestlé, Côte d'Ivoire, under the brand name Bonfoutou[®], was used. It is a commercial product, and according to the producer, Bonfoutou[®] had been prepared from Krenglè. Bonfoutou[®] offers important advantages, namely its good availability and an industrial quality that is irrespective of time, place, and the person preparing it.

2.3. Cooking of "foutou"

"Foutou" was cooked in traditional way, by the same two women during the entire study, using a procedure that can be described as follows. For each variety, 16 tubers of 1–2 kg were peeled and cut into pieces of approximately 0.05 kg for *D. cayenensis-rotundata* and 0.09 kg for *D. alata*, as made traditionally. After thorough mixing of the pieces, a random sample of 1.6 kg was drawn and boiled in 1.3 L of water on a gas stove until the pieces were soft, which occurred after 30 min. As done traditionally, cooked pieces of *D. cayenensis-rotundata* were immediately pounded during 15 min, while the *D. alata* ones were cooled during 15 min before pounded during 8 min for using a wooden mortar and pistil. According to traditional opinion, cooked pieces of *D. alata* must be let to cool for some time before pounding in order to form a firm, doughy "foutou" as preferred by consumers. Yams of *D. cayenensis-rotundata* species are said to not require this cooling step. The resulting dough was then formed into loaves of 500 g. Reconstituted yam dough from Bonfoutou[®] flakes was prepared according to the producer's instructions (Bonfoutou[®], powder/lukewarm water = 1 v/v).

2.4. Descriptive analysis

Six female and six male adults, 25–40 years old, volunteered for the training as panel members for descriptive tests. Two were primary school teachers and the others were literate farmers. All were village residents and belonged to "Baoulé" ethnic group.

Twelve training sessions were held over a period of 7 weeks during which the panel members developed a list of criteria describing the sensory quality of "foutou". For this purpose, four to five samples of "foutou" made from different species and varieties were presented at each session. During the first six sessions of 2 h each, panel members described the attributes of "foutou" in their native language, i.e. "Baoulé", using as many terms as possible. They gave the definition of the attribute or the procedure to assess it. The resulting list of attributes was translated into French by the first author, who is a bilingual "Baoulé" and French speaker. For textural attributes, a polyglot list assembled by Drake (1987) was then used for translation into English. The translation was verified by comparing

Download English Version:

<https://daneshyari.com/en/article/4318181>

Download Persian Version:

<https://daneshyari.com/article/4318181>

[Daneshyari.com](https://daneshyari.com)