AFTER
African Food Tradition rEvisited by Research

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What is AFTER?

• Collaborative research Project - FP7 - 2010/2014

• AFTER aims to revisit traditional African products, knowledge and know-how in the light of new technologies for the benefit of consumers, producers and processors in Africa and Europe.

• Support the implementation of a range of traditional products in African and EU markets

• The project involves seven African countries / four EU countries.
• 16 partners
A balanced partnership between Africa and Europe
What African Food Tradition rEvisited by Research means?

1. AFTER applies European science and technology to African traditional food products

2. AFTER aims to revisit these traditional African products, knowledge and know-how in the light of new technologies and re-engineering methodology

3. AFTER will benefit to consumers, producers and processors in Africa and Europe.
AFTER has four main specific objectives

1) To characterize the existing knowledge and know-how

2) To improve the combined process for a better safety and nutritional quality

3) To evaluate consumer acceptance

4) To transfer the results into ready-to-use information by food companies.
The objectives are integrated in the project

**Characterization of Products**
- Know-how
- Processes

**Improvement of Combined process**
- (Nutritional and safety quality)

**Evaluation of the acceptability**
- by consumers

**Transfer of results**
- (exploitable by companies)

- Characterization biochemical, sensorial, Physico-Chemical, microbiological
- Proces re-engineering methodology
- Acceptability and sensorial analysis
- Transfer of technology
- Analysis of impact
Project organized in WPs

WPO
Project management and coordination

WP1
Characterization of traditional products and know-how

WP2
Process reengineering of fermented cereal based products

WP3
Process reengineering of meat and fish products

WP4
Process reengineering of traditional functional food

WP5
Consumer and market acceptance

WP6
Appropriation of the improved processes and technologies

WP7
Dissemination and exploitation
AFTER is based on three groups of products

1. Fermented cereal-based products
2. Fermented salted fish and meat
3. Traditional plant based extracts for functional food

For each group we selected some traditionnal products (total 10)
Fermented cereal-based products (4)

• A multitude of fermented products made from cereals daily consumed in Africa (beverages, gruel, thick paste...)

• Advantages;
  - inhibition of pathogens / food safety
  - Acidification / preserve the foods
  - sensory properties,
  - removing anti-nutritive compounds
  - enhance bioavailability of components.

• Process combined: cooking, milling or malting.

• Difficult to ensure the consistent quality of the product and particularly its safety

• Meet the demand of new urban consumers in Africa, and furthermore in Europe

• The project focus on cold beverages (Gowé and Akpan), gruel (Kishk S) or thick paste (Kenkey).
Akpan

- a yoghurt-like product
- prepared from a partially fermented cooked maize gruel, named *Ogi*.
- usually mixed with condensed milk, ice and sugar by street vendors just before consumption.
- thirst quenching beverage in Benin,
- very much appreciated by consumers in urban areas
"kishk" : a group of popular fermented dairy cereal mix products common to Egypt and the Middle East.

- The product is made from a combination of wheat with natural local fermented buttermilk in the form of yoghurt or sour milk.
- On completion of fermentation, the mixture is shaped and sun dried.
Dried meat and fish products (3)

- Drying is not always sufficient to stabilise the products
- Frequently salted, fermented and/or smoked.
- Chemical compounds: NaCl, phenolic compounds, bacteriocins ...improve preservation
- Lack of knowledge about the sequence of the unit operations
- Lack of equipment adapted
- Non-controlled processes / wide variations of the stability and quality
- The project focuses on one meat product (Kitoza) in Madagascar (also known as Biltong in South Africa) and two fish products (Lanhoin & Kong) in West Africa.
Kitoza

- *Kitoza* is a salted/dried meat (usually beef).
- Depending on the process conditions, the fermentation can be spontaneous.
- Sometimes, it is smoked in order to improve organoleptic and self-stability properties.
- It is a traditional product of Madagascar. It is also known as *Biltong* in Southern Africa.
Kong (Catfish, *Arius heudelotii*)

- Traditionally smoked in Senegal
- For local and export markets.
- A spontaneous - not voluntary - fermentation step often takes place in the process of traditional dried fish
- Safety issue / deposit of Polycyclic Aromatic Hydrocarbons (PAH)
Plant based extracts for functional foods (3)

• Many parts of plants are traditionally used locally to prepare drinks or foods rich in bioactive compounds.

• The project focuses on
  - fresh juices / dry calyx of hibiscus (*Hibiscus sabdariffa* L.) / fruit pulp of the baobab (*Adansonia digitata* L.)
  - flour to prepare various foods / Jujube (*Ziziphus mauritiana* Lam.)
Bissap

- Dry calyx of the flower (*Hibiscus sabdariffa* L.) is used in Senegal and other Western African countries
- Preparation of beverages and other products
- High anthocyanins content
The baobab (Adansonia digitata L.) is a tree that grows wild in all semi-arid and dry sub-humid areas throughout Africa and Madagascar.

The fruit of the baobab or *monkey bread*, called *Bouye* in Senegal (*Buy* in Wolof), is widely consumed in various forms (juice).
Traditionally studied products have origins in several African countries.
Specific objectives for each group of traditional product

Group 1 - Fermented cereals

New product
Malting, fermentation - starter

Group 2 - Fish and meat

Process control
Drying, fermentation, salting and smoking.

Group 3 - Plant based extract

New processes and technologies
clarification, concentration...
Methodology applied for the re-engineering: example of bissap

1 - Information on bissap collected:
   • know-how, consumption patterns, production techniques
   • Results of quality review
   • Identification of several areas of research.

2 - Complete characterization of bissap
   • Sampling methodology
   • Inter laboratory SOP
   • Chemical, biochemical, sensorial, nutritional analyses
Methodology applied for the re-engineering: example of bissap (2)

3 - Specific study on consumer acceptance of bissap-based products.
• discussion groups to identify a set of descriptors
• consumer surveys (Dakar*, Porto**)
• consumption of bissap juice is determined by sensory criteria

* Sensory profile and acceptability of hibiscus drinks in Senegal; EFFoST Montpellier Oct. 2012 accepted; Aurélie Bechoff & all
** Descriptive Sensory Analysis and Portuguese Consumer Acceptability of Bissap Hibiscus Drinks with African Origin; IUFFOST Iguacu Aug 2012; M. Q. Freitas & all.
Methodology applied for the re-engineering: example of bissap (3)

4 - Developing the anthocyanins in the hibiscus calyx
-Hibiscus contains high levels of anthocyanin, which can be extracted
-Nanofiltration membranes * and osmotic evaporation ** concentrate the anthocyanins (6x) from the hibiscus extract
-The quality of the concentrate is not altered in any way during the operation
-The exportation of hibiscus, in the form of a plant extract rich in anthocyanins, could be an interesting alternative for adding value.

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Partners: CIRAD (Fr); University of Abomey Calavi (Benin); Council for Scientific and Industrial Research (CSIR, South Africa); University of Alexandria (Egypt); Association de Coordination Technique pour l’Industrie Alimentaire (ACTIA, fr); University of Antananarivo (Madagascar); Cheikh Anta Diop University (Senegal); École Nationale Supérieure des Sciences Agro-Industrielles (Cameroon); Escola Superior de Biotecnologia (Portugal); Natural Resources Institute (NRI, United Kingdom); Association Afrique Agroexport (AAFEX, Senegal); Spread European Safety (SPES, Italy); Institut National de la Recherche Agronomique (INRA, Fr); Food Research Institute (FRI, Ghana); Racines (Fr)