

Project update

Geographical focus:	Benin, West Africa
Call reference:	Innovative approaches to process local food in Sub-Saharan Africa and Southeast Asia, which contribute to improved nutrition, as well as qualitative and quantitative reduction of losses
Project title:	Application of new packaging solutions to reduce food losses in West Africa by extending shelf-life of local perishable foods (WALF-Pack)
Cooperating partners:	University of Abomey-Calavi (Benin) Rheinische Friedrich-Wilhelms-Universität Bonn (Germany)
Duration:	01.10.2017 - 30.09.2020
Budget:	351,297.97 €



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Aim of the project:

The WALF-Pack project aims to decrease the food insecurity in Western Africa by reducing food losses through the implementation of simple biobased packaging solutions. Therefore, the extension of the shelf life of perishable foods from West Africa, with focus on the Beninese food supply, through the development of appropriate and simple-to-use biobased packaging solutions is the aim of this research project.

The aim is in line with the key recommendations for improving nutrition through agriculture, formulated with consensus by a broad range of organizations and companies, which will support the project (CSOs, NGOs, government staff, donors, UN agencies), especially with the recommendation related to “improving processing, storage, and preservation” (FAO, 2015).

The objectives are:

- To investigate the entire supply chains of the selected products with focus on the identification of the hotspots and the steps where the losses mostly occur;
- To design simple and cost-effective packaging solutions for reducing the losses of these products along the supply chains, and evaluating the acceptance of different packaging solutions;
- To evaluate the effects of the packaging solutions on physico-chemical, microbiological and nutritional properties of the selected foods during storage;
- To perform cost benefit and resource efficiency analysis for the packaging solutions;
- To implement a good coordination framework among stakeholders at micro, meso and macro levels for a good dissemination of the project outputs.

The application of adequate packaging solutions can significantly reduce food losses in the supply chain. This implies that the availability of the selected food products for consumption will increase and malnutrition can be minimized, because more nutrient and protein rich food is available.

Results

For Work Package (WP) 1, besides the intense literature research on suitable packaging materials for biobased packaging solutions, a total of 2,355 individuals were successfully interviewed in order to determine the food losses in the investigated supply chains. Based on the results obtained, the hot spots of food losses for each supply chain were identified. In the chicken supply chain 6.1% of food losses occur on the processing level. For Waragashi, the hot spots were identified with 11% of losses at transport, retailer/wholesaler and consumer levels each. The hot spot of Gboman was identified at the level of retailer/wholesaler with losses of 16.1%. It is noticeable that the hot spots of each supply chain occur at different levels of their respective chains.

Based on these results and the development of first ideas on biobased packaging, in WP2 the focus on further work was put on antimicrobial active coatings for leaves and fabrics, on the production of paper and biopolymers, as well as baskets. Therefore, 17 biobased materials that are common in Benin and comply to previously defined selection criteria were chosen.

These research findings serve as base for the development of cost-effective packaging solutions based on the goal to reduce food losses.

Therefore, interesting plants from Benin that might serve as potential additives for packaging solutions were studied. The majority of plants showed antimicrobial activity against *Staphylococcus aureus*. Additionally, mixtures of beeswax, oil and different resins were tested for their antimicrobial activity. They showed a significant reduction of *Pseudomonas fluorescens* and *Staphylococcus aureus*. During the project these mixtures will be used as coatings for different surfaces, like leaves and paper.

For the successful development of new packaging solutions, the constant bilateral exchange between scientists and the members of the coordination framework in Benin is highly beneficial (WP5). A scientific exchange between the project partners of the University of Bonn and Abomey-Calavi is maintained through regular telephone conferences and expeditions to Benin and Germany.