iCowpea

Increasing COwpea value chain sustainability in West Africa through Product and procEss innovAtion

ABSTRACT

ICOWPEA project aims to develop in a sustainable way and in an urban context (Cotonou and Dakar cities) innovative cowpea-based products through improved processing methods able to meet both consumer and processor's expectations (technical, nutritional and organoleptic). This dynamic innovation process will be jointly driven by relevant stakeholders of cowpea value chain including Small Food Businesses (SFBs) and consumers and research actors through the set-up of an innovation platform. To have a good insight of the value chain, a participatory diagnosis step on the field with the share of existing knowledge on technologies and traditional know how will be performed. This step will try to characterize:
- the main characteristics of the cowpea value chain and of the SFBs that supply urban consumers (trading, organizational and network patterns, typology of activities, supply and demand, potential market opportunities, weaknesses…);
- the existing traditional and industrial cowpea processing methods both at domestic and semi-industrial scales (processing flow diagrams, efficiency assessment) and the physicochemical composition of the resulting cowpea based products. A focus will be done on soaking, cooking and drying processes;
- the main consumption forms, traditional dishes, potential bottlenecks, mean intakes of micronutrients provided by cowpea-based products;
- the consumers/processors' acceptability and expectations with respect to cowpea product-process innovation;
By revisiting currently applied processing conditions, reengineering of products and processes will be simultaneously carried out:
- at lab scale and pilot scale: the effect of processing variables (temperature, time…) on the behavior (transport & reactions) of several cowpea (anti)nutritional compounds of interest will be studied: vitamins B, starch, protein and anti-nutritional factors (phytates, alpha-galactosides);
- through production trials and consumer acceptability tests in close collaboration with both local cowpea processors and consumers. Based on experimental data, a product-process simulator (mathematical model) describing cowpea physicochemical behavior as a function of processing conditions will be created, adjusted an validated. A first optimization step will allow the identification of consumer-optimal processing scenarios that ensure the most accepted sensory traits and the highest nutritional value while reducing both cooking time and energy input.
Among these optimal consumer-centered scenarios, those which have the highest sustainability potential will be finally selected for commercialization tests. To identify and select the most sustainable scenarios, an impact study will be jointly carried out with stakeholders. This impact study will first consist in the identification and definition of domain of variation of relevant sustainability performance criteria (job creation, productivity, energy savings, income increase…) requested by the actors of cowpea value chain. Using multi-objective optimization method, scenarios obtaining the highest sustainable score will be finally selected and implemented on the field in close collaboration with cowpea value chain actors. A good practice guide will be made and released to local populations. Creating new markets and trade opportunities for improved traditional foods and novel products in Africa will increase economic returns for all stakeholders involved in the production chain, down to the community level.

Keywords : Cowpea product-process, Innovation platform, West Africa, Sustainability, Value chain

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