

Search for a Spanish Partner for a Bilateral R&D Project

Organization	
Date of Request:	1 st March, 2023
Company name:	Council for Scientific and Industrial Research-Food Research Institute (CSIR-FRI), Ghana
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SECTION 1: Entity launching the partner search	
<i>(Please give brief / to the point explanations. For more explanation on any point below, you may add a short paragraph as an annexure, with this document.)</i>	
Sector	Agriculture, agribusiness and postharvest management and value addition to food commodities (Ministry of Environment, Science and Technology and Innovation)
Entity mission or core functions	<p>CSIR-FRI is mandated to conduct applied market-oriented research into problems of food processing and preservation, food safety, storage, marketing, distribution, utilization as well as national food and nutritional security in support of the food industry. It is also mandated to advise government on food policy.</p> <p>Our vision is to be recognized as the leading S&T Institute in the transformation of Ghana's food processing industry.</p> <p>Our mission is to provide S&T support to the growth of the food and agriculture sectors of the national economy in line with corporate prioritization and national growth</p>
Date of establishment	The Council for Scientific and Industrial Research (CSIR) was established by NLC Decree 293 of October 10, 1968 amended by NLCD 329 OF 1969, and re-established in its present form by CSIR Act 521 on November 26, 1996. The genesis of the Council however, dates back to the erstwhile National

	<p>Research council (NRC), which was established by the government in August 1958 to organize and coordinate scientific research in Ghana. In 1963, the NRC merged with the former Ghana Academy of Sciences, a statutory learned society. Following a review in 1996, the Academy was reconstituted into, essentially its original component bodies, namely a national research organization redesignated the CSIR and a learned Society, designated the Ghana Academy of Arts and Sciences.</p> <p>The distinctive features of the 1996 Act are the emphasis accorded private sector concerns and the introduction of market principles into the council's operations, the commercialization of research. In this connection, the council is expected to generate part of its income through the sale of its products and services and to institute a system of contract research.</p>
Ownership (if public and traded, add stock exchange and ticker symbol)	Public
Total number of employees	167
Number of employees in R&D	55
Key products sold or services provided	<p>Research and development. Consultancy services, Accredited methods for Chemistry and Microbiology laboratories to SANAS ISO/IEC 17025 (2017). CSIR-FRI is a center for the development of post-harvest technologies that best fits different aspects of Ghana's food value added supply chain. These technologies are available for processing raw materials into edible forms, improving shelf life of food post-harvest products, developing novel food products for the market, developing innovative products for vulnerable groups (e.g., children, the aged, etc.), and fabricating food processing equipment to reduce drudgery and turnaround time, etc. There is on site and off-site Incubation system centre for SMEs, which enables the Institute to organize technology transfer training programs, back-stop SMEs,</p>

	<p>solve food processing problems, train in GMPs, GHPs, SOPs and set up HACCP.</p>
<p>Entity core technical competences</p>	<p>The Institute have well trained Research and Development scientist; Food microbiologist, Chemist, Nutritionist, Processing engineers, Toxicologist, Sensory Analyst, Entomologist, Food value chain specialist, Business developers and market access specialist. The core values of CSIR-FRI are; Professionalism, quality delivery, team work and competitiveness and Innovativeness.</p>
<p>Key R&D programs and activities</p>	<p>The core R&D centres are Food Microbiology and Mushroom, Food Chemistry and Nutrition and Food Technology Research and supported by commercial activities for the solution of food post-harvest problems in Ghana and income generation. The goal of the institute is to be a center of excellence that conducts market-orientated research and provides accredited technical services to the food industry.</p> <p>It provides technical information, training and services to the private sector and other stakeholders in the food industry. CSIR-FRI is a centre of post-harvest technologies that best fits different aspects of Ghana's food supply chain. These technologies are available for processing raw materials (Roots and Tuber; Cereals, Grains and Legumes; Fish and fish products; Meat and meat products; Fruits, vegetables and spices; Cocoa and cocoa products; Extrusion technology, Herbs and spices processing, Dairy products; Fats and Oil products as well as Mushroom technology and mushroom products) into shelf-stable convenient forms. Technologies are also available for developing novel food products, developing products for vulnerable groups, fabricating food processing equipment. CSIR-FRI has accredited laboratories to SANAS ISO/IEC 17025 (2017). CSIR-FRI offers comprehensive chemical and microbiological analytical services to the local beverage, food, feed and brewing industries. The tests are carried out in accordance with both national and international accepted</p>

	<p>quality standards. Some of the industries and companies we run analysis for are WFP, Cadbury Ghana, Fan milk, Newerest, Pioneer Food Cannery, Equator foods, Blowchem Industries, COA manufacturing company limited among others.</p> <p>CSIR-FRI runs a master's program at the Department of Agro-processing Technology and Food Biosciences of the CCST. The department currently has 52 students of which 9 (nine) have graduated with Master of philosophy in Food Science and Technology, 22 are working on thesis and 11 new students.</p>
<p>Examples of accomplishments</p>	<p>Over the years, CSIR-FRI has hosted scientists and students from various laboratories across several countries within Africa and beyond as part of research collaborations. CSIR-FRI's research efforts and activities have not been limited to Ghana alone but has been aimed towards working together with collaborators within and outside the West African sub-region. This is to ensure innovation in research through regional knowledge sharing to find sustainable food-based solutions to food insecurity and malnutrition. This has resulted in projects including the EU African Food Tradition Revisited by Research (AFTER) project which was a collaboration between (CIRAD, France, Université Abomey Calavi, Benin, Council for Scientific and Industrial Research, South Africa, Alexandria University, Egypt, Université de Ngaoundéré, Cameroon and Natural Resources Institute, UK), SECUREFISH Project in collaboration with (University of Surrey, UK) with CSIR-FRI as leading institution.</p> <p>Others include Building on Success of the Marketplace (MBOSS) Project in which partners institutions were Federal University of Agriculture, Abeokuta, Nigeria, Embrapa (The Brazilian Agricultural Research Corporation) Brazil and Université Abomey</p>



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Calavi, Benin. For the Cassava: Adding Value for Africa (CAVA) I & II project funded by Bill and Melinda Gates, the institute collaborated with University of Greenwich, UK. CSIR-FRI collaborated with the public Universities and the Ministry of Food and Agriculture on the World Bank funded West Africa Agricultural Productivity Project (WAAPP) I&II project. Currently, under the GC fermented Foods projects, collaborators are from University of Health and Allied Sciences and Ngouchi Memorial Institute for Medical Research in Ghana, Africa Science and policy Institute, South Africa and the EU Horizon 2020 Healthy Food Africa Project, in which CSIR-FRI is collaborating with University of Zambia, Makerere University, Uganda, Université Abomey Calavi, Benin among others. South Africa and EU Healthy Food Africa under the EU horizon 2020 project is collaborating with (University of Zambia,,Makerere), Université Abomey Calavi, Benin among others. Through participation in workshops, conferences, technical committee meetings and donor funded projects, scientists from CSIR-FRI have established national and international networks, developed capacity through graduate trainings (15 PhDs, and 20 MPhil.) and the institute has also benefitted from some laboratory equipment (HPLC, GCMS, Soxhlet among others).

Furthermore, CSIR-FRI's expertise in laboratory management systems spans over two decades. The Institute's Food Microbiology and Food Chemistry laboratories were the first in West Africa to get accredited to ISO/IEC 17025. Also, our Food Microbiology laboratory was recognized in 2020 by the African Union as a collaborating Centre for Food Safety in the field of laboratory testing, training and research on microbiological contaminants in food and feed.



	<p>Some technologies developed over the years:</p> <ol style="list-style-type: none">1. Tiger nut composite flour and products2. Instant <i>koose</i> mix3. Fruit leather from African star apple4. Crackers from soybean flour, high quality cassava flour and starch5. Instant <i>fura</i> powder6. Wooden-gas cabinet dryer7. Weaning food blend from cashew apple8. Instant cashew powder9. Six cyclone flash dryer10. Puffed rice (from broken rice)11. Rice flakes12. Rice snack bar13. Canned soups (<i>kantomire</i>, palm)14. Canned stews (garden eggs, <i>kantomire etc</i>)15. Coconut milk16. Canned turkey berry puree17. Convenient green pepper sauce18. Powdered bissap drink19. Drum-type peanut roaster20. Wooden cabinet dryer21. Cabinet solar dryer22. Instant cocoa powder beverage23. Extruded snacks24. Prekese pellets25. Millet cereal26. Pancake mix
Company strategic orientation	<p>We have two main streams in the institute. They are core research and non-core research. The core activities is focused on generating technologies to support agro-processing industries to reduce drudgery and turnaround time for improved process and product quality. We undertake research into product development for food commodities for improvement of the country's economy by improving livelihood and empowering women and vulnerable in their daily activities. The core research supports the accredited laboratories with analytical services for agro industries, agribusiness environment and SMEs. The core research is also involved in donor funded collaborative research where technologies are developed to curb food safety and food security problems. A</p>



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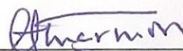
	<p>practical oriented Master of philosophy Food Science and Technology program is run in CSIR-College of Science and Technology. CSIR -Food Research Institute hosts the Department of Agro-processing and Food Biosciences.</p> <p>The non-core supports the generation of Internal Generated Funds in the plants we have cited at the institute: roots and tubers processing, processing of cereals and legumes, mushroom cultivation area and spawn production for farmers and populace among others. We also have incubation centres and unit operation processing services. We can boast of product development and sensory evaluation section.</p>
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SECTION 2: Spanish Company Profile

(Please provide a brief summary of the prospective partner company or organization. This summary may address some or all of the points below)

Profile of ideal technology partner	A company into research and development and processing, preservation, packaging, storage, marketing and distribution of foods
Core technological competencies and expertise	Fortification of foods especially oils with local foods example carotene from carrots or Orange fleshed sweet potatoes in root crops products, turkey berry in juices and spices among others. Accredited and Analytical laboratories facilities
Other essential qualifications (e.g.: ownership, track records etc.)	
If you have a list of companies with whom you are in contact or interested in contacting, please provide contact details	N/A
If you are interested in collaboration: please specify details and other important information you want to share with a potential company	Food fortification is one of the various means used to alleviate micronutrient deficiencies worldwide. Carrots are root vegetables which are known to have high concentration of beta carotenes, a pre-occurring form of vitamin A. In

	<p>Ghana, locally produced coconut oil, groundnut oil, palm kernel oil, and sheanut oil samples undergo strenuous processing procedures which tend to reduce the beta carotene concentrations in the oils produced. Addition of beta carotene extracted from carrots will increase the beta carotene concentrations of these oils. This study will investigate the physicochemical, functional, sensory and packaging, shelf-life characteristics of coconut, groundnut, palm kernel and sheanut oils when fortified with different levels of beta carotene extracted from carrots and other sources of local foods rich in beta carotene.</p> <p>Findings from this study there is a likelihood of increasing the beta carotene concentration of locally produced oilseed samples with acceptable physicochemical, functional, packaging, shelf-life and sensory characteristics</p>
Interested areas of collaboration	Fats and oils chemistry technology Fortification of Foods
Specific R&D contribution you are seeking/offering	<p>Expertise in food fortification especially oilseed oils(coconut, groundnut, palm kernel and sheanut) in Ghana.</p> <p>Expertise in beta carotene extraction and stability in fortification.</p> <p>Marketing of developed technology for end users for establishing companies</p>


 Signature

Name: DR. CHARLOTTE ODURO-YEBOAH

Date: 03/03/2023