

## OYSTERS HAVE POTENTIAL AS A RICH SOURCE OF MICRONUTRIENTS IN GHANA

By Seth Adu-Afarwuah and Brietta M. Oaks

In June-July 2022, Francis Zinenuba Taabia collected hundreds of oyster samples from three estuarine sites in Ghana including the Bortianor area (Densu Estuary, Greater Accra Region), Ekumfi Narkwa (Narkwa Lagoon, Central Region), and New Amanful-Apremdo-Beahu area (Whin Estuary, Western Region). He carefully shucked the oysters, extracted and hand-cleaned the meat, packed, and labelled them individually in polystyrene bags and headed for the laboratory in the Department of Nutrition and Food Science at the University of Ghana.

Taabia, a 34-year-old PhD candidate in the Department of Nutrition and Food Science at the University of Ghana, assisted in the analysis of a total of 915 oyster samples in the lab over the next few months. Working on an activity led by Brietta Oaks from the University of Rhode Island and Seth Adu-Afarwuah from the University of Ghana, Taabia's work has helped determine the concentration of essential minerals in these oysters, identifying oysters as a key food that could be used to address micronutrient deficiencies common in Ghana. This analysis has determined that heavy metal contamination is not a concern in the area with levels of mercury, arsenic, cadmium, and lead all below international regulatory limits.



*Taabia's photo was taken while helping with the analysis of the oyster samples. (Photo by Samuel Bioh)*

The Feed the Future Innovation Lab for Fish, alongside the University of Ghana and the University of Rhode Island, is conducting this research in Ghana to examine the potential contribution of oysters to the iron and zinc intakes of women shellfishers 15-49 year of age across three estuarine sites in Ghana and to assess whether heavy metal contamination of oysters is a concern at these sites. This Fish Innovation Lab activity is supporting Taabia's dissertation research with funding for field work, laboratory analysis of the oyster samples, and write-up of results.

In Ghana, the harvesting and processing of oysters are the mainstay of household subsistence and income for many women (i.e., women shellfishers), living along estuarine sites where oysters are consumed frequently. Despite a substantial reduction during the last few decades, the prevalence of anemia in the country remains high, partly because of low iron intakes from animal-source foods. In 2017, 36% of children 6-59 months of age and 22% women 15-49 years of age were anemic, and 22% of children 6-59 months of age and 14% women 15-49 years of age had iron deficiency. Oysters might provide an easily accessible source of protein and micronutrients to contribute to anemia prevention among women shellfishers in Ghana, but the health risks of their consumption due to heavy metal contamination has not been well-investigated.

"For the oyster samples analyzed, the average concentration per 100 g wet weight was 12.5 mg for iron, 8.2 mg for zinc, and 0.54 g for selenium," Taabia said. "These are relatively high mineral concentrations, which

## PROJECT TEAM

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suggest that oysters could provide an accessible and rich source of these micronutrients to address anemia among women and children living along the estuarine sites."

When Taabia enrolled in the PhD program in 2021, he was not sure he could complete the program on time, knowing how difficult it is for students at the University of Ghana to find research support. Now, after completing the mineral and heavy metal analysis of the oyster samples thanks to the assistance from the Fish Innovation Lab activity, he is on track to finish his PhD on time while also getting to work in his area of interest, which is maternal and child nutrition.

Taabia agrees that with the low level heavy metal contamination of oysters in Ghana, oysters can now be used as a nutrient-rich food source to address nutrition deficiencies in the diet, and there is little concern for adverse health risks.

"I hope the results from these analyses will help promote oyster consumption," Taabia said, "particularly among the women shellfishers that harvest them."

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## ABOUT THE FISH INNOVATION LAB

The Fish Innovation Lab supports the United States Agency for International Development's agricultural research and capacity building work under Feed the Future, the U.S. Government's global hunger and food security initiative. Mississippi State University is the program's management entity. The University of Rhode Island, Texas State University, Washington University in St. Louis, and RTI International serve as management partners.

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