AWARD
African Women in Agricultural Research and Development

Profile

2014 AWARD Fellow

Deborah Louisa Narh Mensah

Position	Research Scientist
Institution	Council for Scientific and Industrial Research— Food Research Institute (CSIR-FRI)
Country	Ghana
MSc	Biotechnology, Wageningen University, 2013
Mentor	Dr. Charles Tortoe, Head of Food Processing and Engineering Division, CSIR-FRI
Research Area	Improving mushroom cultivation techniques using various biotechnological tools, and analyzing the antibacterial and antioxidant potential of mushrooms.

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Deborah Louisa Narh Mensah never suspected that the mushrooms she saw growing in the wild as a youth would become a central focus of her early career.

When Mensah began studying biological sciences at Ghana's Kwame Nkrumah University of Science and Technology, she acquired a taste for research, but had no idea how or where she would apply it.

The answer came the following year during her compulsory national service. By chance, she was assigned to CSIR-FRI's Mushroom Unit. "Until then, all I usually heard about mushrooms was how dangerous they could be," she says. "I had no idea of their benefits—or that such a small thing could improve lives in so many ways."

Though widely underappreciated, mushrooms contain both nutritional and medicinal properties. Numerous varieties grow in Ghana, but the oyster mushroom (*Pleurotus ostreatus*), originally from China, is the most commonly consumed. Like many other edible varieties, it contains low dietary fat, but is high in protein, B vitamins, and antioxidants (thought to reduce cell damage and prevent disease). In her current research, Mensah is analyzing the antioxidant activities of different varieties of wild and cultivated mushrooms. She is also involved in collecting, classifying, preserving, and analyzing Ghana's indigenous and wild mushrooms to protect their biodiversity and better understand their characteristics.

Beyond their food and nutritional value, mushrooms also offer an environmental plus. "We can produce mushrooms using various agro-industrial waste products, reducing pollution and increasing gains

from the production chain," says Mensah, explaining that mushrooms thrive on all sorts of dead or discarded plant material. She has experimented with growing mushrooms using cotton waste, plantain leaves, rice straw and husk, wheat bran, cassava peels and sticks, and yam peels.

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Mensah is working with women cassava farmers in Sierra Leone, using the cassava waste to produce oyster and other mushrooms as a source of nutrition, improved health, employment, and income. She is teaching groups and interested entrepreneurs in Ghana to produce spawn, which is used as seed and can be cultivated or sold. Mensah, together with her colleagues, also produce hybrid mushrooms, which they share with entrepreneurs in Ghana, Sierra Leone, Trinidad and Tobago, and other countries as they inform them about mushroom cultivation, teaching them to create hybrid varieties that could increase consumption and marketability. Mensah also conducts participatory work with farmers on the indigenous use and knowledge of mushrooms.

Mensah recently took a study leave from her research institute to complete an MSc in Biotechnology at Wageningen University in the Netherlands. Her research included extracting and purifying an enzyme called polyphenol oxidase in Irish potatoes, which causes browning in various bacteria, plants, and fungi, including mushrooms, in order to understand its properties and function, and to reduce its effects during storage and processing.

Mensah also looked at the adaptive evolution of the bacteria *Lactobacillus helveticus*, which is involved in the fermentation of milk for producing cheese. She intends to use the skills acquired in this thesis to study common indigenous foods of West Africa, such as *gari*. "By isolating the organisms involved in the fermentation process, we can try to evolve them to work more quickly or adapt to changing conditions, such as a warmer environment for improved functionality," she explains.

Going forward, Mensah plans to pursue a PhD and move up the research ladder, and hopes to eventually become a leading female scientist and director of a research institute. She sees her AWARD Fellowship as a life-changing opportunity to hone her skills and raise her profile to benefit her career, her institute, smallholder farmers, and other stakeholders.

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AWARD is a career-development program that equips top women agricultural scientists across sub-Saharan Africa to accelerate agricultural gains by strengthening their research and leadership skills through tailored fellowships. AWARD is a catalyst for innovations with high potential to contribute to the prosperity and well-being of African smallholder farmers, most of whom are women.

AWARD is generously supported by the Bill & Melinda Gates Foundation, the United States Agency for International Development, and the Alliance for a Green Revolution in Africa. For more information, visit www.awardfellowships.org