

Jamaican Delicacy Makes a Comeback

Statistical research helped put ackee fruit back on U.S. grocery shelves.

Sweet ackees—the national fruit of Jamaica—are back in cans on U.S. retail shelves after an import alert had once again taken them off. That's partly because ARS agricultural engineer Thomas Whitaker provided a viable sampling plan to test the safety of the imported product. Whitaker is in the ARS Market Quality and Handling Research Unit in Raleigh, North Carolina.

Ackee fruit is smart because it knows how to defend its seeds until they mature to ensure a continued existence. When the fruit is still unripe, it contains a toxin, hypoglycin A, or HGA, that sickens anyone who dares to eat it. Because of the risk that unripe ackee containing HGA could enter the United States, the U.S. Food and Drug Administration (FDA) banned the canned fruit from import in 1973.

But the health hazard diminishes when the fruit is allowed to ripen completely before consumption or canning. So in 1998, the Jamaican government and several local processing firms developed safety plans to show they could control HGA. Only properly ripened ackees, without seeds, membrane, or outer rind, would be used in canning. The FDA inspected the processing firms and exempted them from the import alert.

"The first shipments came in 2000," says Joyce J. Saltsman with FDA's Office of Food Safety. But by December 2005, a variety of factors led to a series of safety-test failures. "The processing firms that had been exempted from the import alert were now back on automatic detention," says Saltsman. "Their food-safety systems needed to be reevaluated."

The only way that FDA could reestablish exemption status for any of the firms was to develop a monitoring program that balanced the cost of reducing the risk of accepting bad lots with the cost of an efficient sampling program. For that, they needed a statistical expert, and they found him in ARS's Whitaker.

"Among national and international commodity markets, he is considered an

expert for his work in producing objective data on food toxins," says Saltsman. Whitaker's statistical analysis pointed to randomly selecting 10 cans out of each 1,000-can lot, combining the fruit pieces, and then testing the batch to see whether or not it exceeded the toxic tolerance level.

To arrive at this strategy, Whitaker measured the variability in HGA concentration among individual cans in a lot and found that as concentration within a lot goes up, so does variability.

"From the variability estimates, we predicted how much an increase in the number of cans to be inspected could reduce the risk of accepting lots that exceed the FDA limit," says Whitaker. A cost analysis revealed whether the expense of conducting the sampling was prohibitive. In this case, it was not.

"FDA not only uses Whitaker's sampling plan, but so do Jamaican authorities and laboratories," says Saltsman. "We have once again exempted all the firms from the import alert, so they now ship product to the United States."—By **Rosalie Marion Bliss, ARS.**

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Unripe ackee fruit is closed.

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Ripe ackee fruit.