

Microwave Meter Measures Moisture and Density of In-Shell Peanuts

November 20 2009, By Sharon Durham



ARS scientists have developed a microwave meter that measures moisture and density of in-shell peanuts faster and easier, both important quality indicators. Image courtesy of Microsoft clipart.

(PhysOrg.com) -- A microwave meter that instantaneously measures both moisture and density of in-shell peanuts has been developed by Agricultural Research Service (ARS) scientists, making it easier and faster for producers and processors to determine these important quality indicators.

Moisture content is the most important factor in [peanut](#) quality. Kernel moisture content must be less than 10.5 percent, because higher levels can lead to the growth of fungi that produce aflatoxins, which cause illness in animals and humans.

The new apparatus measures density and moisture independently, eliminating an extra testing step and improving an earlier ARS technology that used radio frequencies to determine moisture content.

Using the new technology, peanut graders can determine peanut kernel moisture content with only about 0.5 percent standard error. ARS engineer Samir Trabelsi and retired ARS engineer Stuart O. Nelson, in the ARS Quality and Safety Assessment Research Unit at the agency's Richard B. Russell Agricultural Research Center in Athens, Ga., developed the microwave meter. The method is rapid, nondestructive and eliminates the need for shelling the peanut pods.

In the new process, in-shell peanuts are loaded directly into the sample holder of the microwave meter, and an antenna transmits low-intensity microwaves into the peanut pods. The microwaves pass through the pods and are received by another antenna facing the transmitting antenna. Alterations in the energy level and velocity of the microwaves, as they pass through the pods, reveal moisture content in the kernels and bulk density of the peanut pods. A computer is attached to record moisture and density measurements. For moisture content determination, the new technique also eliminates the need for multiple calibrations and compensates for density and temperature.

The technology has been given a provisional patent and is being tested at five peanut buying stations in Georgia, Alabama and South Carolina.

Provided by USDA Agricultural Research Service

Citation: Microwave Meter Measures Moisture and Density of In-Shell Peanuts (2009, November 20) retrieved 11 September 2024 from <https://phys.org/news/2009-11-microwave-meter-moisture-density-in-shell.html>

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