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IMPEDANCE MEASUREMENT OF IRRADIATED POTATOES:
A METHOD TO IDENTIFY RADIATION PROCESSINGNélida Lúcia DEL MASTRO
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Radiation-induced chemical interactions may be manifested by a change in physical properties. Beside the nucleus, membranes are vital targets during cell irradiation. Membranes of living tissue, regardless of plant or animal origin, play a vital role for the selective transport of ions. A change in membrane properties may be traceable by a change in ion transport mechanism implicating a shift in electrical impedance.

The potato is firmly established in many parts of the world as a major staple food. Then, radiation processing of potato is approved in many countries for sprouting inhibition and extension of shelf life in a dose range from about 0.01 to 0.15 kGy of ^{60}Co .

The use of electrical conductance methods for the detection of salmonella, some virus or the action of herbicides on plant has been reported and differences have been observed between instruments in respect of the magnitude of conductance change or rates of change in conductance response.

A reliable technique to identify irradiated potatoes or other food products has not been established so far, though several methods have been reported. Electrical impedance might thus serve for characterization of unirradiated and irradiated tissue and cells. In this work, potato tubers from an European variety, named Bintje, grown in São Paulo State were employed. Potatoes were punctured with steel electrodes and impedance measured at different frequencies (1kHz-100kHz) by passing 3-5mA alternating current through it. The impedance ratio of 50kHz/5kHz calculated from ten replicate samples decreased with the increment of dose when doses of 0, 0.075 and 0.15kHz from a Gammacell 220 were utilized. The impedance measurements were slightly affected by the place of puncture but not by storage up to 3 months.