

**Title** Effects of roasting, powdering and storing irradiated soybeans on hydrocarbon detection for identifying post-irradiation of soybeans

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#### **Abstract**

Hydrocarbons, which are produced by irradiation of lipid-containing foods, were analyzed in irradiated soybeans, which were roasted, powdered and stored, to determine whether these treatments affect hydrocarbon detection for identifying post-irradiation of soybeans. Soybeans were irradiated (Irr), irradiated and roasted (Irr-Rst), roasted and irradiated (Rst-Irr), irradiated, roasted and powdered (Irr-Rst-Pwd), and roasted, powdered and irradiated (Rst-Pwd-Irr). They were stored at refrigerated or room temperature for 30 weeks. Oils were extracted using hexane and Na<sub>2</sub>SO<sub>4</sub>. Hydrocarbon fraction was separated through a Florisil column and analyzed using GC. Hydrocarbons 17:2, 16:3, 17:1 and 16:2 were not detected in non-irradiated soybeans and soybean powder, but they were detected in those irradiated at 0.5 kGy or higher. The levels of the hydrocarbons increased with dose. The hydrocarbon levels in the Irr-Rst, Rst-Irr, and Irr-Rst-Pwd soybeans were little different from those in the Irr soybeans. Hydrocarbon detection in the Rst-Pwd-Irr soybean powder showed a slightly different pattern from those in the other treatments. Hydrocarbon levels in the soybean and soybean powder samples stored at refrigerated temperature for 30 weeks changed little, compared to initial samples. The hydrocarbon detection patterns in the samples stored at room temperature for 30 weeks were similar to the initial and refrigerated samples with slightly lower detection levels in the room-stored samples.