Ionizing radiation can be applied to honey to inactivate *Paenibacillus larvae* spores and so prevent American foulbrood honeybee disease dissemination, which impairs international trade. Hydroxymethylfurfural (HMF) is a reaction product of sugars decomposition, used as indicator of freshness and heating abuse in honey.

Two honey varieties: liquid and creamy, were irradiated at a Co-60 semi industrial facility, activity: 600.000 Curies, with doses of 10, 20 and 40 kiloGrays. HMF content was measured (AOAC) along 22 storage months in the darkness at 23 ± 5 ºC and 57 ± 7 % RH. Results were statistically analyzed.

This treatment diminished HMF content, mainly in liquid honey, probably due to secondary irradiation effect. Along storage an increased HMF content was observed in every sample, which was steeper in liquid irradiated honey. On the 18th. storage month, the HMF values of the 40 kiloGray samples overpassed those of the control sample, which did not happen in creamy honey. Considering that HMF content is a balance between its synthesis and degradation, at short storage times the radiolysis could prevail, and at long storage periods, the synthesis. A substance found after glucose radiolysis, 3-deoxyglucosone, has been reported as an intermediate reaction product in the HMF synthesis pathway from glucose or fructose.