

Title Disinfestation of stored wheat grain and flour using gamma rays and microwave heating
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Abstract

Samples of wheat grain and flour (20 gm of each) were infested with 20 larvae or 5 pairs of adult insects of *Tribolium confusum*, *Lasioderma serricornes*, *Corcyra cephalonica* or *Rhyzopertha dominica*. The infested samples were tested as follows : (1) microwave heating at four temperature levels 40, 45, 50 and 55 °C, for exposure times from 10 to 50 s; (2) gamma irradiation over the dose range of 0.5–4 KGy; (3) gamma irradiation + microwave heating. Complete kill of all stages tested was achieved at 50 °C with an exposure time of 50 s. A dose of 2 KGy induced 100% mortality of *R. dominica* after three days, but it took up to 7 days for all *T. confusum* and *L. serricornes* adults to die after a 4-KGy exposure. All insects died within 24 h when exposed to the combination of 1KGy + 50 °C for 30 s.

Biochemical analyses on the samples of wheat grain and flour subjected to those treatments at which high mortality was obtained generally showed no detectable changes in the quality of protein, fat, fiber, carbohydrates or ash. The germination of wheat grain was lowered after treatment with microwave radiation but was not affected by a dose of 1 KGy gamma radiation.