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Abstract

Methodology and Theoretical Orientation:

Campylobacteriosis is the most commonly reported food-borne illness in the EU. Radiation treatment is an effective way to ensure food safety. *C. jejuni* is usually described as a quite sensitive to physical factors used for food preservation. The study examines the effect of two forms of irradiation on *C. jejuni* reduction on raw beef and pork. Three *C. jejuni* strains were used. Two of them were isolated from the chicken cloaca, and one from the faeces of a hospitalised child with acute diarrhea. All food samples were contaminated with mixture of the three *C. jejuni* strains at 8 log CFU/g and subjected to gamma radiation (chamber equipped with 54 cobalt sources) with doses 0.25, 0.5, 0.75, 1 kGy, and microwave (MV) radiation (2,450 MHz, 180 W) for 30, 60, 90, 120 and 150 s.

Findings:

As regards radioresistance, *C. jejuni* demonstrated D-values of 0.21 kGy in beef and 0.20 kGy in pork meat. Decimal reduction times for *C. jejuni* subjected to MV radiation were 19.92 and 44.84 minutes when inoculated onto beef and pork, respectively. Individual measurements taken after 30s, 60s and 120s of microwave treatment found the internal temperature of the meat to rise considerably. In the case of pork, this temperature reached a maximum after 30s of microwaving. Additionally, we present linear regression equations that enable the degree of reduction in the number of *C. jejuni* to be calculated for any values of radiation or the duration of its application, for a given product.

Conclusion and Significance:

C. jejuni is particularly sensitive to ionizing radiation. It is relatively difficult to assess the sensitivity of *C. jejuni* to microwave energy due to the non-uniform temperature distribution and lack of sufficient kinetic data. In general, our findings indicate that sensitivity of *Campylobacter* appears overestimated.

Image:

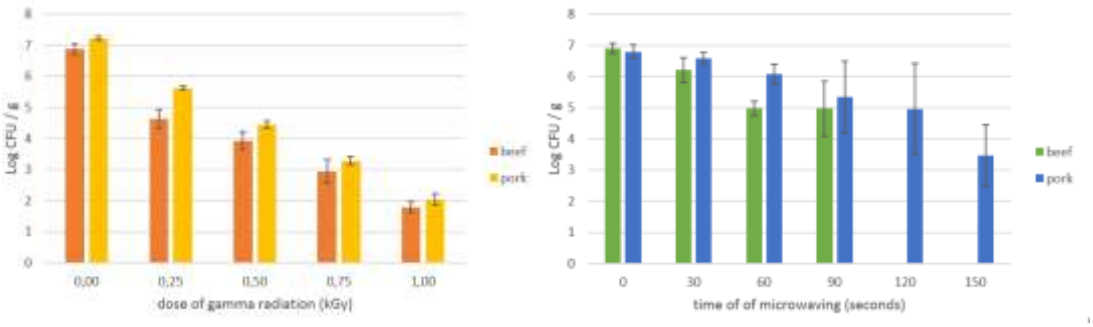


Figure: The effect of gamma radiation (left) and microwave radiation (right) on the survival of *C. jejuni* in beef and pork.

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Biography

Agnieszka Jackowska-Tracz PhD, DVM, is assistant professor in Department of Food Hygiene and Public Health Protection, Faculty of Veterinary Medicine, Warsaw University of Life Sciences – SGGW (WULS-SGGW), Warsaw, Poland. She conducts research on the impact of various factors on the ability to reduce pathogens in food of animal origin, and studies on the potential use of nanotechnologies to improve the hygiene of the production environment. Her field of specialization is hazard analysis and improvement of HACCP systems. She conducts classes and lectures for veterinary students and postgraduate students in the field of safety of animal origin products.

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