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## The effect of gamma and microwave radiation on the inactivation of *Campylobacter jejuni* in beef and pork meat

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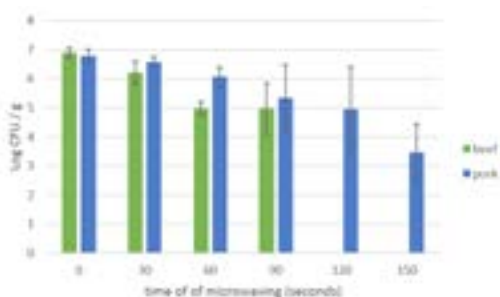
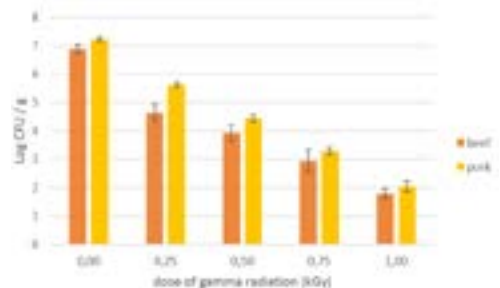
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**Introduction:** Campylobacteriosis is the most commonly reported food-borne illness in the EU. Radiation treatment is an effective way to ensure food safety. *C. jejuni* is usually described as a quite sensitive to physical factors used for food preservation.

**Methodology & Theoretical Orientation:** 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 feces of a hospitalized 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 radio resistance, *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 & 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.



# Food Safety And Regulatory Measures

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## Recent Publications

1. Jackowska-Tracz A, Tracz M and Anusz K (2018) Integrated approach across prerequisite programmes and procedures based on HACCP principles. *Medycyna weterynaryjna* 74(4):223-227.
2. Szczawinski J, Szczawinska M, Lobacz A, Tracz M and Jackowska-Tracz A (2017) Modelling the growth rate of *Listeria monocytogenes* in cooked ham stored at different temperatures. *Journal of Veterinary Research* 61: 45-51.
3. Szczawinski J, Szczawinska ME, Lobacz A and Jackowska-Tracz A (2016) Modeling the effect of temperature on survival rate of *Listeria monocytogenes* in yogurt. *Polish Journal of Veterinary Sciences* 19(2):317-324.

## Biography

Agnieszka Jackowska-Tracz has completed her PhD, DVM, and currently she is an Assistant Professor in the Department of Food Hygiene and Public Health Protection, Faculty of Veterinary Medicine at 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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