



E-beam Treatment to Improve Beef Safety FOS.04.10

Project Title: Use of Low Dose e-Beam Irradiation to Reduce *E. coli* 0157:H7, Non-0157 (VTEC) *E. coli* and *Salmonella* Viability on Meat Surfaces

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Background: Outbreaks of food poisoning still occur despite significant improvements in methods to minimize food pathogens on beef. Irradiation of beef can be a very effective process to eliminate food pathogens. Although irradiation has been approved for use in decontaminating beef in the United States, approval is pending in Canada. Public acceptance of irradiation will succeed when it is used with discretion. Some research has shown that low dose irradiation of beef effectively reduces surface pathogens with minimal effects on meat quality. Further Canadian research low dose irradiation is needed to gain approval of this process as a tool in the beef safety arsenal.

Objective: To generate laboratory data that can be used to predict whether e-beam treatment of beef carcass surfaces can yield pathogen-free ground beef patties of acceptable quality.

The research is divided into three parts. For part one, more than 5 strains of *E. coli* 0157:H7 and 18 strains of non-0157 VTEC *E. coli* as well as 10 serovars of *Salmonella* will be tested for their sensitivity to 1 kiloGray (kGy) e-beam treatment. In the second part, strains of each organism having greater irradiation resistance will be pooled into three separate groups to determine their sensitivity to 1 kGy irradiation at high and low levels of inoculation on beef surfaces maintained at 25°C. Pathogen viability will be monitored in storage at 4°C for up to 5 days representing beef held prior to grinding. For the final part of the research, beef trim containing 10, 20 or 30% fat will be vacuum packaged before being irradiated prior to grinding and being stored at 4°C for 5 days. Untreated beef will be included as a control for food safety and quality. Ground beef containing 0, 10, 20, 50 and 100% irradiated meat will be evaluated by a taste panel and subjected to other analyses of quality.

Implications: Improved safety will maintain and improve consumer confidence in Canadian beef.

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