

BCRC BEEF SCIENCE CLUSTER

Research Facts

IN PROGRESS

Improving the Shelf Life of Ground Beef FOS.01.09

Project Title: Examining the Decontamination of Beef Trim by Spraying it with Lactic Acid Solution

Researchers: Dr. Colin Gill, AAFC Lacombe and Dr. Lynn McMullen, University of Alberta

Background: Approximately two per cent of beef trim produced in Canadian plants must be used in cook-only applications at reduced prices or rendered because of the presence of *E. coli* 0157. Canadian beef trim is also tested at the U.S. border and further tightening of the regulations is anticipated. Lactic acid treatment of trim is generally preferred to other possible treatments by the beef packing industry; Health Canada has recently approved the application of up to 5% lactic acid on trim.

Objective: Determine the antimicrobial effectiveness of lactic acid on pathogenic *E. coli*, *Salmonella* and *Listeria monocytogenes*, effects on shelf life and beef quality of treated trim product, and provide recommendations to the Canadian beef industry on how lactic acid sprays can be used most effectively.

These researchers will construct a cabinet to spray lactic acid onto a defined meat surface area, at a constant rate, for variable times. The cabinet will be used to treat beef trim that has been inoculated with a 5-strain cocktail of *E. coli* 0157. The trim will be treated with various amounts of 5% lactic acid for various times, and the reductions in *E. coli* 0157 numbers will be determined in beef ground shortly after the treatment or after one or two weeks storage in vacuum pack.

A treatment that gives the greatest reduction in pathogen numbers using the least amount of lactic acid will be identified. This treatment will then be applied to trim inoculated with varying numbers of acid resistant *E. coli* 0157, *Salmonella* and *Listeria monocytogenes*. Batches of treated trim will be ground shortly after treatment, after aerobic storage for three days, or after storage in vacuum pack for 14 days. Treated and non-treated ground beef and patties will be evaluated for appearance, color, odor, shelf-life and eating quality. Generic *E. coli* in treated and untreated commercial product will be enumerated to specify performance criteria for effective trim decontaminating treatments, and reductions in numbers and prevalence of *E. coli* 0157 will be used to estimate the benefits of implementing an effective lactic acid treatment for decontaminating beef trim.

Implications: Ensuring safety without impacting appearance, shelf life or eating quality will help maintain domestic and international consumer confidence in Canadian beef.

The Beef Research Cluster is funded by the Canadian Cattlemen's Association and Agriculture and Agri-Food Canada to advance research and technology transfer supporting the Canadian beef industry's vision to be recognized as a preferred supplier of healthy, high quality beef, cattle and genetics.

Proudly funded by:

